LARA V2.1

Local and sub-Regional Airspace Management Support System

Update from V2 to V2.1

Civil-Military ATM Coordination Division
Directorate Single Sky

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1 Introduction

The main reason for the upgrade to LARA V2.1 was to improve long-term performance and stability of the software. Alongside these improvements, new functionality and a few changes to existing functionality have been introduced. This document will explain the main changes and function as an addendum to the current released User Manual V2. The next LARA Version 2.2 is expected to change in terms of functionality and behavior of the HMI more significantly – the User Manual is expected to receive a full overhaul for 2.2.

This document will focus on the changes and improvements directly noticeable by the operational user of LARA. New functionality that is effective behind the scenes will be mentioned only to facilitate understanding. The LARA Technical Manual V2.1 will provide additional information on how to use some of these “technical” improvements further.

One of these performance modifications is the retirement of data on the client after a predefined time period. It avoids loading the client and the network with transmission of old data. The default logic is the following:

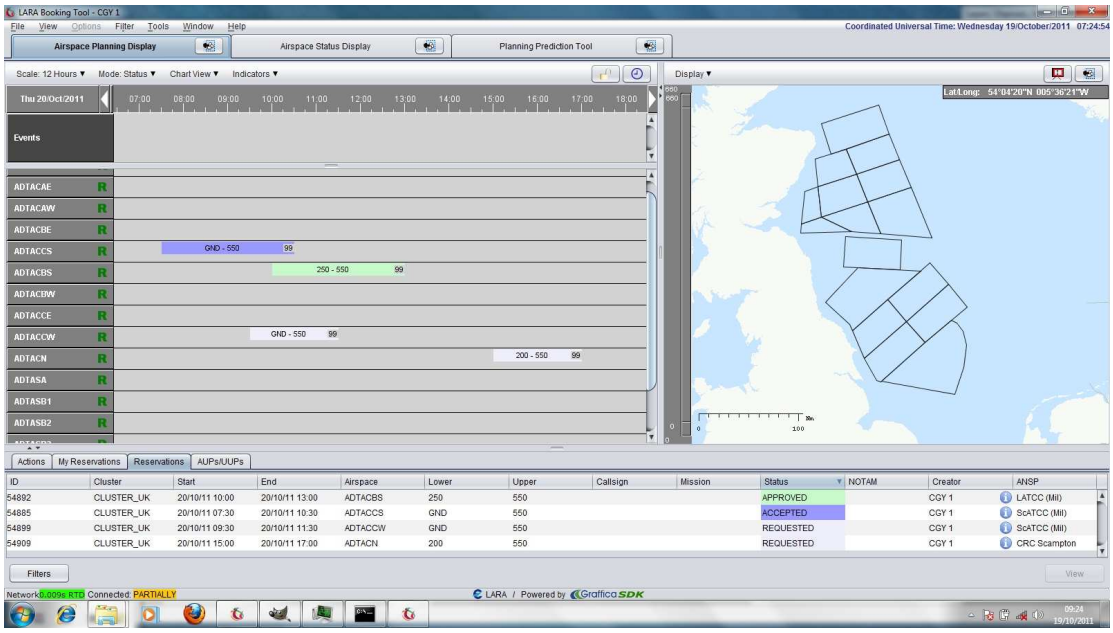
Reservation will be retired on the third midnight after the completion of a reservation. If the reservation completes at 22:00 on day 1, it will be removed from the client at 00:00 on day 4. Airspace data as another example is retired 10 days after its lifetime has ended. By default the retirement process runs at 00:00 each day. This time is editable and can be changed by your system administrator.

Please note that reservations will not be deleted, they remain stored in the LARA Cluster Server database and are available for retrieval. The data is stored in the database until it is archived. The archiving functionality will be included in a future release. For the configuration of the retirement functionality, please refer to the LARA Technical Manual LARA V2.1.

Another important change is the capability to run over more complex network setups. The V2.1 software allows a LARA Cluster Server to register multiple IP addresses with a Discovery Server which can then be used by clients to connect to it. This provides support for configurations whereby a LARA Cluster Server is connected to multiple networks. The detailed settings and are described in the LARA Technical Manual V2.1

2 Changes to the HMI

The HMI has changed slightly in order to re-organize and harmonize the behavior of mouse interactions, options, filters etc. Some user requests, which were easily changeable without having a negative effect on other functionality, have been introduced as well.



A LARA client screenshot highlighting some of the HMI changes in V2.1

The most noticeable changes are:

- To open an *Airspace Reservation Editor* the user has to *double click* with the left mouse button on the *Planning Chart*, which is in line with current standard and norms of windows based applications. With previous versions of LARA a right mouse button click was required.

- The size of the *reservation bars* has been adapted to allow the user to view more airspace in a single window. The font size has been adjusted accordingly.

- The text label within a *reservation bar* adjusts its position automatically to stay on the screen as long as possible while scrolling through time. This is applicable to events and to reservations.

- When working on the *Action Tab* of the *Airspace Planning Display*, the user was previously presented with a number of buttons at the bottom of the display. These buttons were present depending the possible actions of a user on a given reservation. These buttons will now be visible at all times, but are being grayed out if not applicable

for a given reservation. This shall ensure consistency and allow the user to always find the same buttons at the same place.

- The tables of the *Planning Information Display* have been adjusted: the row height and size of the fonts have been slightly increased to allow for a better readability.

- *Shadow bookings* associated to linked airspaces are labeled "*linked airspace*".

- Two new layout options are available, which allow utilizing more area for the Planning Information Display and thereby creating more room for the tables and columns. To use these layout options, choose *Tables Across Bottom 1* and *2* from the *View → Layout* Menu as displayed in the screenshot below:

Two new layout options are available

- The Filters have been re-organized to allow for a consistent usage throughout the LARA Application.

Filters will open in a dedicated window

These Filters are accessible via the Filter Menu

- Old reservations will now be “Retired” after a predefined timeframe in order to relieve the Client and the HMI from processing “old” data. Currently, reservations older than 3 days will be “retired” and are consequently not accessible by the regular clients. This will be indicated by a line trailing the *Current Time Indicator* in order to indicate beyond which point old reservations will not be displayed any longer. This *Retirement Time Indicator* is selectable for display from the *Indicators Menu*.

Select Retirement Time from the Indicators Menu to display the Retirement Time Indicator

- Checkmarks and bullets are used now to indicate if an option is exclusive, or if multiple selections are possible. Checkmarks are used if multiple options are selectable at once, e.g which type of airspaces to display. Bullets are used for exclusive options, i.e. only one option is selectable for display at any given moment, as is the case for the Radio Buttons from the Mode Menu on the HMI.

Checkmarks are used if more than one option can be selected at once

3 Changes to the PPT

The Calculation Method of the PPT has changed. In earlier versions of the software the PPT was continuously calculating all reservation changes in the background. In order to make best use of available resources this has been changed. The PPT will now only calculate once when the user accesses the PPT Tab and changes the view (scroll through time or the list of airspaces etc). All colours, conflicts, activations and alike will not be visible during calculation and will reappear once calculation is complete. The system will display a calculation warning at the top of the PPT to indicate to the user that calculation is being performed. The absence of conflicts and activations on the PPT during the calculation process can be irritating when first using the new PPT – they will appear as soon as the calculation is complete.

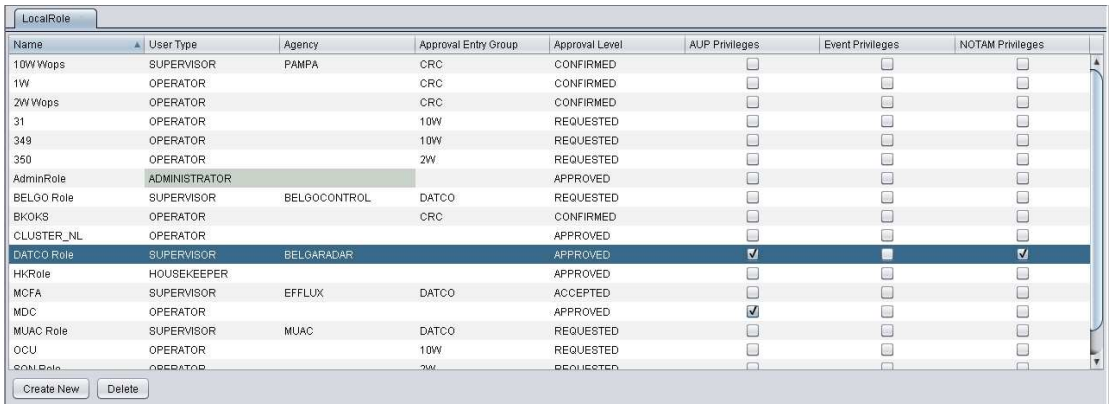
The menu structure on the PPT has been adapted as well

4 NOTAM Functionality

Based on user request the NOTAM Functionality has been changed. Via the Admin Tool a number of roles can be assigned “NOTAM Privileges”, which will trigger actions on them via their Action Tab in case a NOTAM needs to be published, cancelled or updated.

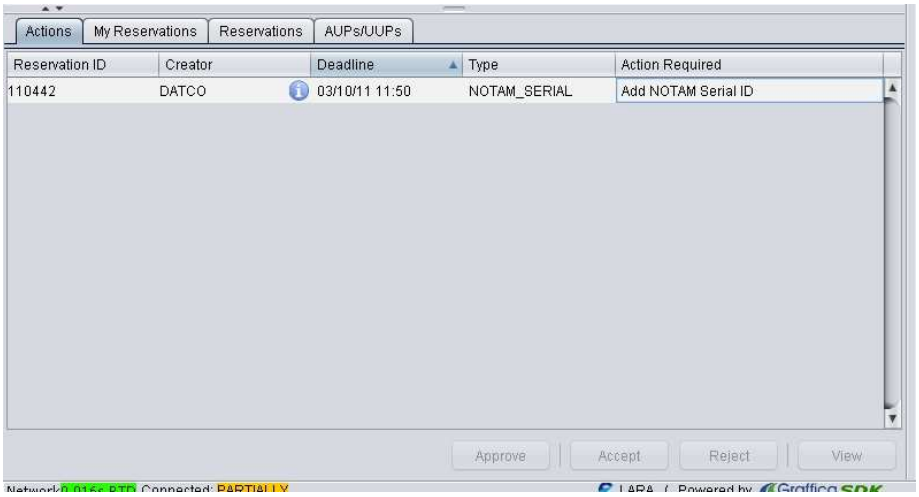
Once the action has been completed by one of the assigned users, it will disappear from all assigned Action Tabs. It is also possible to not assign

NOTAM Privileges to any user, which will not trigger any actions, while at the same time not negatively inhibiting the remaining functionality.



NOTAM Privileges assigned to the DATCO Role ion the Admin Tool

In the previous version of LARA a user could simply select to mark a "*NOTAM as generated*". In this version the user will be triggered to enter a NOTAM Serial ID in line with the NOTAM Request. This shall provide another layer of confirmation that the NOTAM has been published or cancelled.

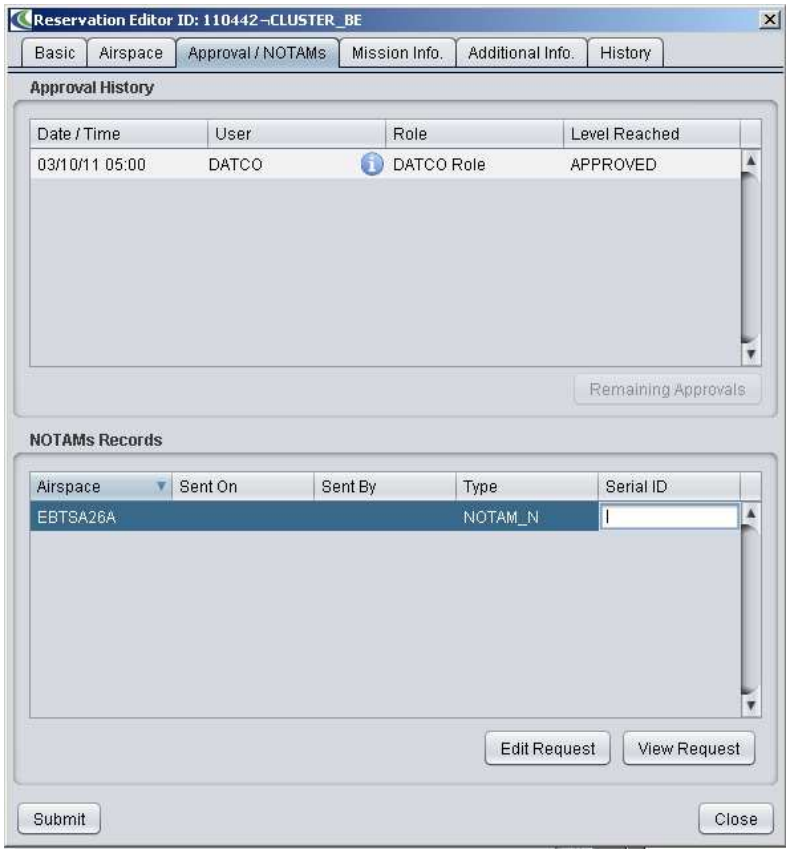


The user DATCO has an action for NOTAM Publication via the Action Tab

In order to enter the Serial ID the user has to open the *Airspace Reservation Editor*, move to the *Approval/NOTAM* Tab and select Edit. Then it is required to select the appropriate line in the *NOTAM Records Section*.

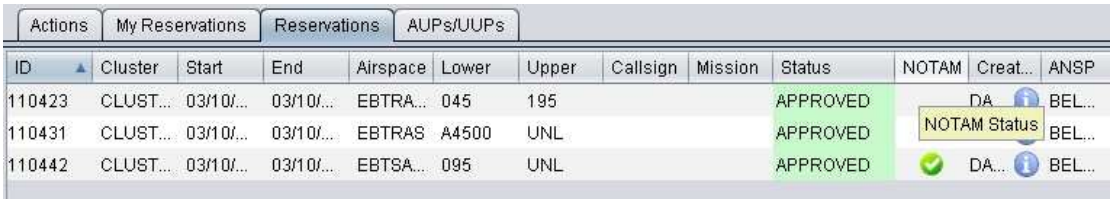
Note: The Editing, Viewing and Exporting of a NOTAM Request has not changed, please refer to the appropriate section of the User Manual V2.

The user can access the Serial ID field via a double click in order to enter the appropriate NOTAM Serial ID.



The ARE is ready to accept the appropriate NOTAM Serial ID

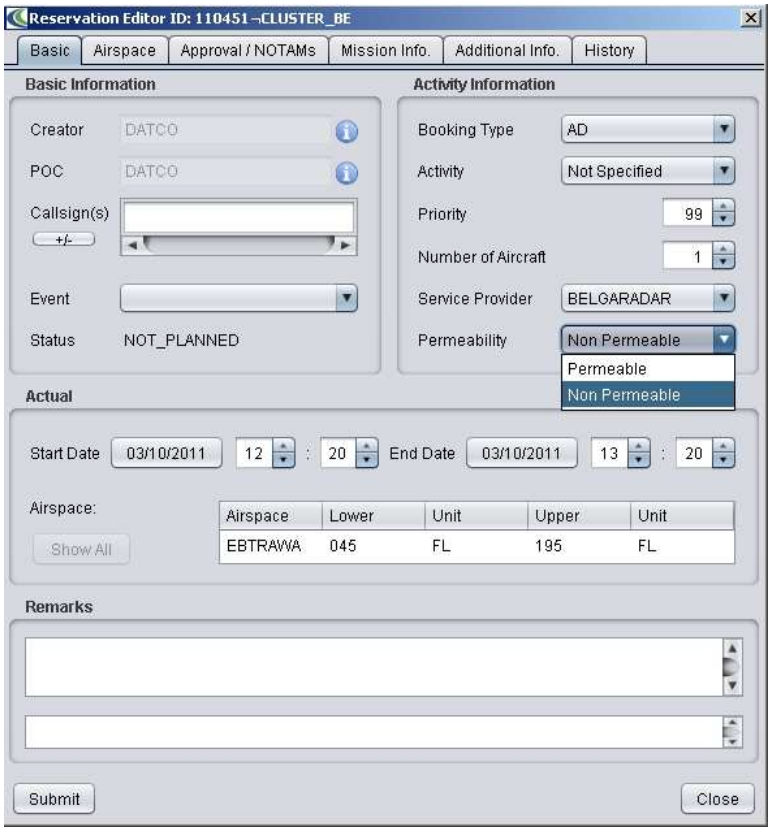
If the format of the ID is not correct, it will be displayed in red. Once the ID is entered correctly and the *Submit Button* is pressed the Action will disappear and the Reservation will show a green check mark in the *NOTAM* Field on the *Reservations Tab*.



The symbol to indicate proper NOTAM Handling has not changed

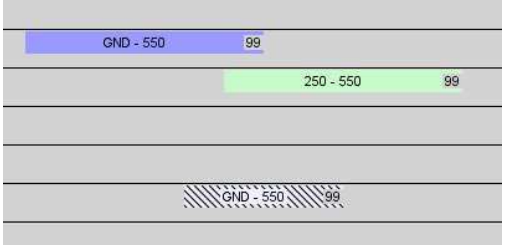
Once a reservation is updated or cancelled, the appropriate roles will again be triggered to fill in the appropriate Serial ID (e.g. NOTAM-C ID).

5 Permeability Option



The ARE has a new field which allows specifying the permeability

The LARA User Group has requested the option to allow specifying and displaying the permeability status of an airspace reservation on LARA. As a first step and implemented in LARA V2.1 is the option to mark and display a reservation on the planning chart as permeable or non-permeable. Non-permeable reservations are considered the default in LARA and are indicated as “normal” reservation bars filled with a single color. Permeable reservations are indicated by a hashed shading of the reservation bar as displayed in the screenshot below. The shadow booking of a reservation receives the same hashing if applicable.



Hashing indicating the permeability of this reservation

In order to allow this distinction, the size of the reservation bars and the fonts had to be adapted to be able to simultaneously display the hashing and the text inside the reservation bar. This display might as well improve readability of the HMI.

The option to make a reservation permeable or non-permeable can be found in the Activity Section of the Airspace Reservation Editor. The default setting is “Non-Permeable”. The LARA Admin can select for the system if the permeability option is available for use or grayed out and not accessible. He is also in the position to define the naming convention. It is therefore possible to change the name “permeable” into “non-segregated” if applicable. This is done by the resource files found on the client positions named “clientSettings.gsdk”

```
// Permeability resources.
// The permeability terminology specified should either be
// "permeability" or "segregation". Where used in the booking tool
// the terminology specified will be displayed.
PERMEABILITY.TERMINOLOGY "permeability"
// If a reservation is permeable this will determine if the hash
// is shown on the booking slot.
PERMEABILITY.SHOW_PERMEABILITY true
```

6 CDR1 Reservation

It is now possible to insert a reservation request for CDR 1. These will behave like normal reservations in terms of status, colour and display, but will have no effect on AUP/UUP calculation and on the CDR real-time-status display; the CDR status will follow the AUP/UUP publication. They serve simply for information purposes.

LARA V2

Local and sub-Regional Airspace Management Support System

Operator User Manual 2.0

Civil-Military ATM Coordination Division
Directorate Single Sky

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1 Introduction

The *Local and sub-Regional Airspace Management Support System (LARA)* was developed in order to improve airspace management processes by providing mutual visibility on civil and military requirements, by increasing mutual understanding and by enabling a more efficient collaborative decision-making process. The aim is to provide a harmonized national and sub-regional ASM support system meeting the operational requirements of stakeholders. The *European Commission* actively supports *LARA*'s development.

LARA provides real-time exchange of airspace management data between involved actors enabling collaborative decision-making and an enhanced situational awareness throughout the airspace management process.

LARA's functionality encompasses all phases of airspace management – reaching from long term *Event Planning* to *Airspace Management at Level 2 and 3* - including real-time coordination of airspace activations. The capability to connect a national LARA system to neighboring LARA systems allows seamless coordination between different states and facilitates efficient cross border operation.

LARA provides a user-friendly interface to allow online airspace reservation, enable transparent coordination and maximize automation of routine tasks. Through a shared real-time airspace status display, situational awareness of all players is enhanced and flight safety greatly improved. The system is designed to allow configuration of all relevant system parameters to adapt to national procedures.

The LARA software is developed by the UK based company *Graffica Ltd.* under supervision of *EUROCONTROL's Civil-Military ATM Coordination Division (CMAC)*. LARA's development and its requirements are based on operational best practices and are driven by its potential users.

This document serves as the User Manual for the *LARA Software Version V2* and all of its functionality. Its aim is to enable users of LARA to get acquainted with the software and to provide a reference manual for guidance during every-day operational use. It shall allow a user to quickly find information on all aspects of the system.

The manual will focus on the use of the system by operators – administration of the application will be covered in the Technical Documentation of LARA. If, however the understanding of the software functions requires a look "behind the scenes" into the Administration and Housekeeping Tool this will be covered within this document.

In order to demonstrate the functionality of LARA this manual will use a set of airspaces with generic roles and users normally involved in airspace

management. Airspace structures, procedures and rules will not resemble real-life operations and are merely used to demonstrate the concept and its application using the LARA Software.

Certain components of the LARA Software are involved in taking and communicating safety critical decisions and require special awareness or procedures to be in place to remedy any safety implications. These will be described in this manual in *Chapter 8 Safety Requirements*.

The LARA Software is highly configurable – both in terms of look and feel and available functionality. Wherever applicable these differences will be explained.

This manual will follow a common sequence of events in the airspace management process and explain the parts of the software along this thread, i.e. Planning Phase, Assessment, AUP/UUP Publication, Real-Time Status and Tactical Planning Updates.

Basic operation of windows based systems is not explained within this user manual. Please contact local IT Support Staff if you have questions on basic navigation within the operating system and its windows.

If questions remain unanswered or certain functionality is not sufficiently explained, please contact the *EUROCONTROL LARA Team:*

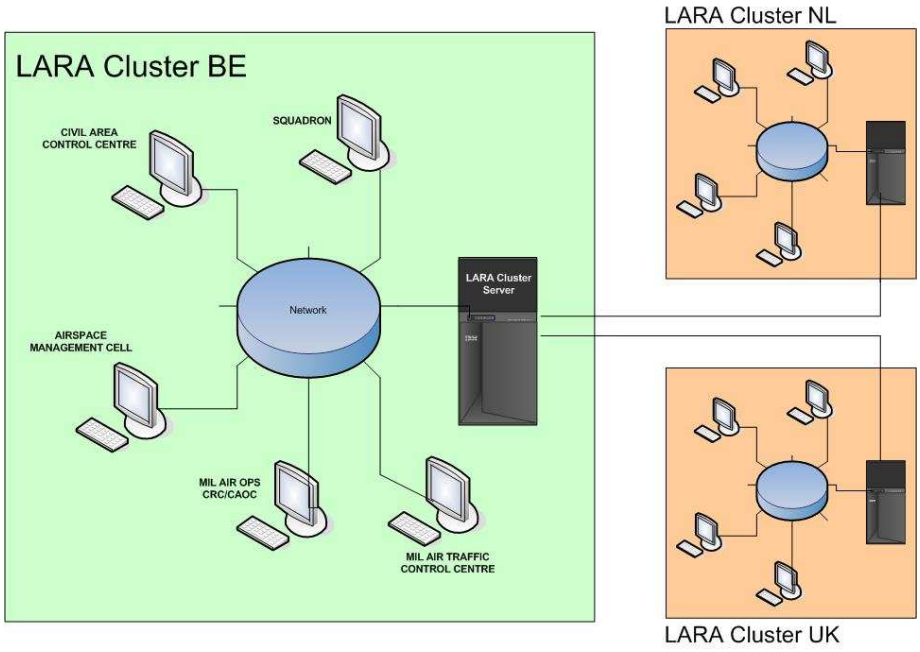
lara@eurocontrol.int

2 The LARA System

The LARA software is running within a *JAVA Environment* and can be operated on various operating systems including *Windows, MacOSX* and *Linux*. It communicates on standard IP-networks and supports common encryption standards. In order to run LARA J*AVA Runtime Environment* has to be installed. If you experience problems in running the software please contact the LARA System Administrator.

LARA is organized in *Clusters*. One cluster corresponds to a LARA System deployed within organizational (*FAB*) or national borders. A LARA System consists of a Central Server and connected LARA Working Positions. Clusters can be interconnected to allow cross border airspace allocation and collaboration.

This User Manual will explain the use of the software displaying Belgian airspace structures. The figure below illustrates the cluster concept and a fictional setup within the Belgian Cluster and possible cluster connections to neighboring countries.



A potential network setup between various clusters

The LARA Server stores all data and manages the communication within the cluster. LARA's architecture allows deploying a second redundant server,

which will ensure continuation of service even after a failure of the main server.[1]

The different LARA Working Positions and the LARA Server communicate using the Internet Protocol (IP), which can be used on a variety of network architectures.

The LARA Servers maintains an SQL Database that manages all data. This data is composed of static components like airspace structure, user accounts and the approval chain and dynamic data, which encompass all reservations, activations and related processes.

To acquire access to this data and provide inputs a user has to login to the system via the connected clients.

2.1 System Start-up

In order to successfully start the LARA software it is required that the Cluster Server is up and running and a network connection between the server and the client is available. In case it is not possible to start the system, contact the LARA System Administrator.

The LARA Software starting up after successful login

[1] The current implementation requires the server and redundant counterpart to run on a special Linux Fedora Distribution.

There are effectively two ways to start and deploy the system on a Client PC: The most common way is to copy the client software to the PCs hard disk drive and run it via a batch file. The second option is using *LARA's web-start functionality*, i.e. running the software using an Internet browser - downloading and starting the software via the network. This way the software can be started on every PC connected to the network.[2] The operation of the software including the look and feel of all windows is identical, regardless how the software is run.

2.2 Login

After launching the LARA Client Software you are presented with a login window. The system requires every user to authenticate himself to the server with a valid username and password. Only after the user is positively identified the application starts-up.

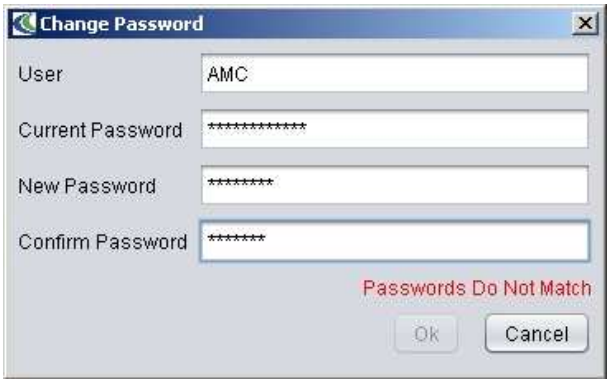
The LARA Login Window

2.3 Change Password

The login window allows every user to change an existing or request a new password. Clicking on the Advanced Options of the Log-in Window will allow access to these additional options.

To change the password, select the appropriate option. This opens another window allowing the user to specify login name, current password and the new password. The process can be cancelled at any time by selecting the *Cancel Button.*

[2] The JAVA Runtime Environment has to be installed on the PC to run LARA.



In case the passwords do not match
the system will warn you appropriately

After the new password is inserted twice the *Ok button* will become available. After pressing *Ok*, the password will have changed successfully. The system will inform the user about the successful change and send an email confirming the new password.

Note: The email functionality is only available if the LARA System has been configured for email exchange. Please contact the LARA System Administrator for more information.

2.4 Request New Password

In case the password is lost or forgotten, the user can request a new password from the LARA System by selecting the *Request New Password Button*. This will open a new window, which allows the user to specify his login name and email address. A new password will be sent to the user's email address. The system checks the entered email address against the pre-configured email address for this user. If it does not match, an error will be displayed and a new password will not be sent. Again, this functionality is only available if email exchange is configured for the LARA Cluster.

By specifying our User Name and Email Address
the system will provide you with a new password

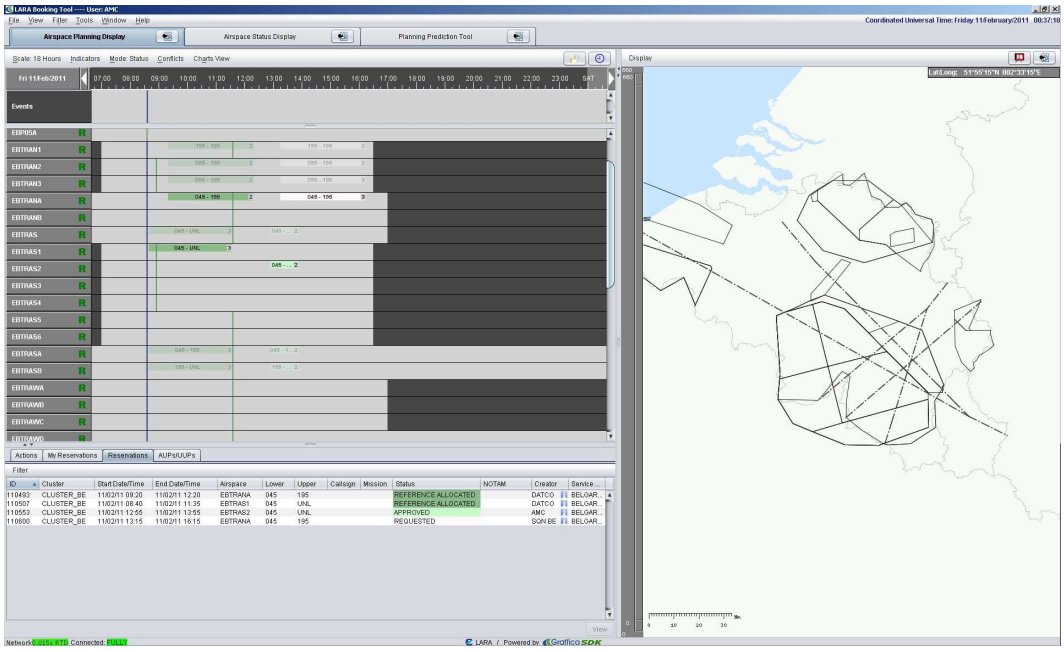
Note: The LARA System Administrator is not aware of the passwords selected by users and cannot retrieve any password if it has been lost. However, the administrator can manually overwrite a password and thereby choose a temporary password for every user. This password will be valid as long as the user does not change his password using the previously explained functionality.

3 The Human Machine Interface (HMI)

The HMI is in principle identical for all users of LARA. However, some of the functionality within LARA is reserved for certain functions in the Airspace Management Process and might be unavailable for some users. More details will follow throughout the User Manual.

The *LARA HMI* is composed of three main tabs – each of them designed to fulfill a certain task at a certain phase of the airspace management process. These are:

- Airspace Planning Display
- Airspace Status Display
- Planning Prediction Tool



The LARA HMI opens with the Airspace Planning Display Tab per default

The active tab is highlighted with a blue transparent background color at the top. The three different tabs, their purpose, details of operation and their configurability will be thoroughly explained in the appropriate sections of this User Manual.

All tabs have in common the *Menu Bar* on top of the screen giving access to certain tools and filters required to operate the software. Additionally the bottom of the screen serves as an information and warning area. This will provide information on the *network status*, the connection status to other clusters and will show *attention-getters* in case the user is required to perform a task or alike.

3.1 Main Menu Bar

Before moving on explaining the different tabs of the HMI in detail, some information on the general menus and options. *Menu entries* like *View* and *Window* will be explained later in more detail:

- *File → Print*

  This will print the current visible windows if a suitable printer is available and installed on this computer.

- File → Logout

  This will close the application and returns the user to the login window.

Note: It is acceptable to logout and login multiple times – however, it is advisable to close the JAVA Application and re-start the batch file in regular intervals. A repeated logout/login will effectively waste system resources and might be result in a performance hit.

- Filter

  This section allows filtering the current view. The filters are different for each tab and will be explained in more detail for each tab accordingly.

- Tools

  Access to a variety of tools is given here, including *AUP-, Mission-, Event Management and Chat Functionality*. More details are described in the appropriate chapters.

- Help → LARA Help

  Opens the *User Manual*

- Help → Legends

  Provides an overview over colors used on the HMI

- Help → About

  Presents details on the Version of the LARA software and the underlying *Graffica Software Development Kit (GSDK)*.

3.2 Status Bar

At the bottom of the HMI certain fields indicate *network status*, *cluster connections* and *attention-getters* for the system.

In the lower left corner the status of the network connection can be monitored. A green color indicates that the connection to the server is alive; the *Return Trip Time* (RTD) indicates the speed and responsiveness of the network. If the network connection to the cluster server is lost it will turn red and the client will be automatically logged out.

The LARA Network Indicator

The green indication showing the words *FULLY* provides information on the connections to other clusters. If the mouse cursor hovers over this field a pop-up window will show details on the cluster connections. If this field turns to orange the connection to certain clusters have been lost or are not established yet.

The LARA Cluster Connection Indicator
Here only a local cluster connection is used

The lower right corner is reserved for symbols used as *attention-getters*. Three different symbols are available:

- The blue flag indicates that a user has open actions waiting in the *Action Tab* of the *Planning Information Display*. The number next to the symbol indicates the number of open actions.

- The red flag will only be visible to users with supervisor privileges. It indicates that the user is required to confirm or acknowledge an airspace activation. The number indicates the number of outstanding airspace activation actions.

- A blue bubble indicates that a chat message has arrived and is yet to be read.

Clicking on any of these symbols will take the user to the appropriate window to complete the task. More details on the individual actions will be explained later in the appropriate chapters.

4 The Airspace Planning Display (APD)

In order to insert a reservation request in LARA the operator needs to use the *Airspace Planning Display Tab*. When logging into the LARA System it is opened by default.

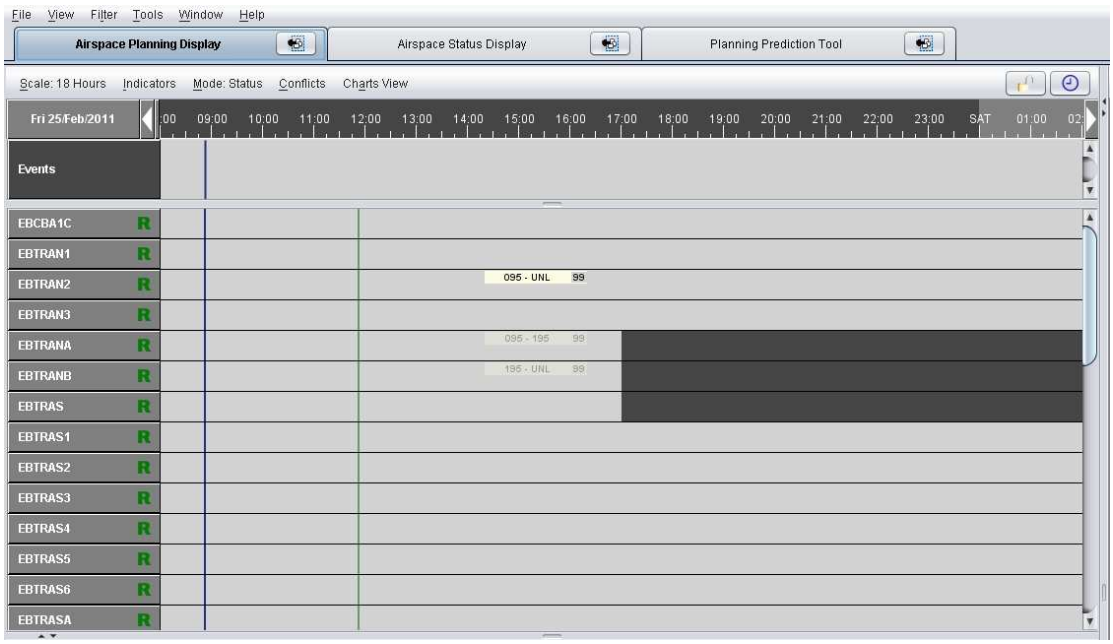
The *Airspace Planning Display (APD)* will very likely be the most used area within the LARA Application and hosts the arena for all planning activities. *Requests, Approvals, Proposals* will be managed from this tab and the latest status is available here.

The *Airspace Planning Display* consists of:

- *Airspace Planning Chart* - providing an overview of airspaces, reservations and their current status
- *Airspace Visualization Display (AVD)* - a map displaying the respective airspaces
- *Planning Information Display (PID)* - providing additional information on reservations and their status in a tabular overview.

All three areas of the *APD* are linked to each other. For example, hovering over an airspace on the *Airspace Planning Chart* will highlight the respective Area or CDR on the *AVD*. Clicking on a reservation in the *Planning Information Display* will jump to the respective reservation on the *Planning Chart* opening a pop-up with additional information. These types of links between different windows will be found throughout the application. More details follow whenever applicable.

4.1 Airspace Planning Chart



The "Airspace Planning Chart" providing a graphical overview over airspace reservations

4.1.1 Areas of Interest

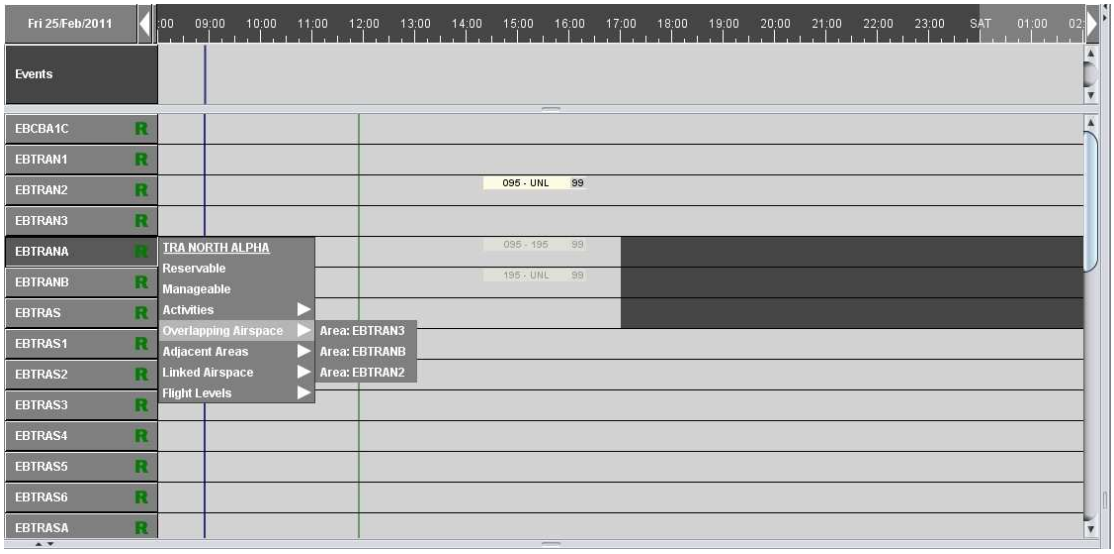
On the left side of the *APD* the user will find the list of available airspaces, called the *Areas of Interest* using the standard ICAO Name starting with the national location indicator, e.g. EB for Belgium.

Note: The list of airspaces is likely to be longer than what can be displayed on the screen at once. Use the scroll bar at the right of the Airspace Planning Chart to scroll up and down to see additional airspaces. Alternatively, the mouse scroll wheel can be used while hovering over the Planning Chart.

Next to the name you will find a green *R.* This means that you as a user are eligible to make reservations for this airspace. Should the *R* be crossed out the user does not have sufficient privileges to make a reservation.

Note: In LARA the word airspaces is used as a general term for areas and routes.

Clicking with the right mouse button on the area of interest will open a window with additional information for this airspace. The following entries are found in this additional information menu[3]:



The "Areas of Interest" and the additional information that is obtainable via a right mouse button click

- *Airspace Name* – the local name for the applicable airspace.
- *Reservable* or *Not Reservable* – depending the privileges the user has been assigned. This is in line with the green "R" found on the area of interest.
- *Manageable* or *Non Manageable* – this indicates if the *Airspace Management Cell (AMC)* has authority to manage the activity times of this airspace or not. Quite often Danger Areas are not (AMC-) manageable and their status is determined by the respective *Aeronautical Information Publication (AIP)* or as defined by *Notice to Airmen (NOTAM)*.
- *Activities* – hovering over the Activities field will open a sub-list providing details on the activities allowed in this area. The entries in this list are for information purposes only; they do not have a functional effect in LARA.
- *Overlapping Airspace* - hovering over this field will show the airspaces (areas and CDR segments) that are vertically and laterally at least partially overlapping this area. A reservation in

[3] If you disagree with information presented on your LARA System, please contact the LARA Housekeeper. Most of the mentioned fields in this section are editable by the LARA Housekeeper Tool.

any of these airspaces with an overlap in time and levels will trigger LARA to issue a conflict warning.

- *Adjacent Areas* - hovering over this field will show the areas that are adjacent to the selected areas. This will allow adding multiple areas into one reservation (to be discussed in detail in the section on making airspace reservations).

- *Linked Airspaces* - hovering over this field will show the airspaces that are linked to the selected airspace. LARA treats linked airspaces like overlapping airspaces; triggering a conflict if booked in parallel. They are however not necessarily geographically overlapping, but have been linked for procedural reasons.

- *Flight Levels* - hovering over this field will show the minimum and maximum vertical limits (in Altitude or Flight Levels) defined for this airspace.

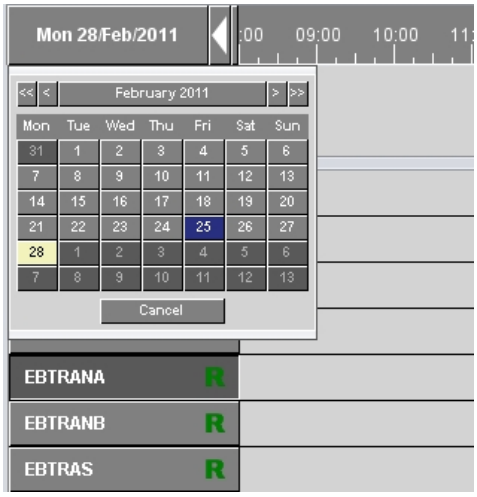
4.1.2 Time line

On top of the Airspace Planning Chart the time line is displayed. It starts on the left hand side with the selected date, followed by the hours of the day. The background colors of the timeline are alternating between light and dark grey to indicate a change of date.

For navigating on the time line the arrows left and right to scroll back and forth are used. Another option is clicking on the time line with the mouse, which will turn the cursor into a double arrow. While keeping the mouse button pressed, moving the mouse left or right will scroll the time line swiftly in the desired direction.

4.1.3 The Calendar

To select a date click on the displayed date field and select from the calendar the desired date with the left mouse button. The calendar display will close automatically and the planning chart of the selected date is displayed.



Clicking on the date will open "the Calendar"

To browse through the calendar use the arrows left and right of the displayed month. A click on the single arrow will move one month back or forth; a click on the double arrow will move through the years respectively.

The current selected date is colored beige; the current day (if visible) is displayed blue.

To close the calendar without selecting a new day click the "CANCEL" button or simply click outside the calendar window.

4.1.4 Time Scale

As a default the Airspace Planning Chart will display a range of 18 hours. This can be adapted by selecting the Scale Menu above the Timeline. LARA can display time scales from 3 hours up to 2 weeks on the Airspace Planning Chart.

Note: Selecting a high time scale will shrink the reservation bars respectively. Depending the duration of a booking request and the selected time scale, reservations might disappear completely.

Select a different time scale from the scale menu

4.1.5 Events and Charts View

Below the timeline and above the airspace planning chart an additional row is displayed called EVENTS. Via the Charts View Menu on top of the Airspace Planning Display Menu Bar, the user can select if the Events Chart shall be displayed or not. More information on Event Management will be available later in this chapter.

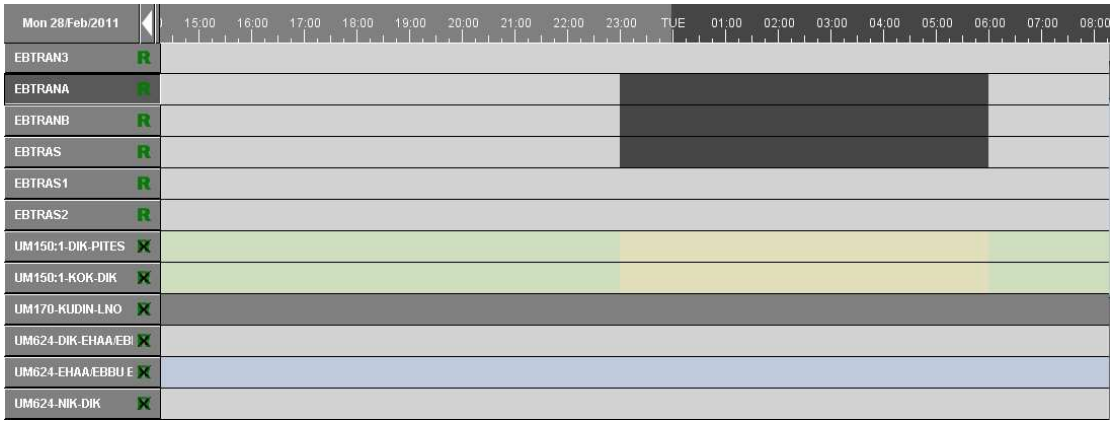
The “Events Chart” and the options to select what to display on the APD

4.1.6 Background colors of the Planning Chart

The combination of airspace/area of interest and the timeline displays potential areas for introducing airspace reservations. Previously entered reservations will already be displayed here through the use of reservation bars.

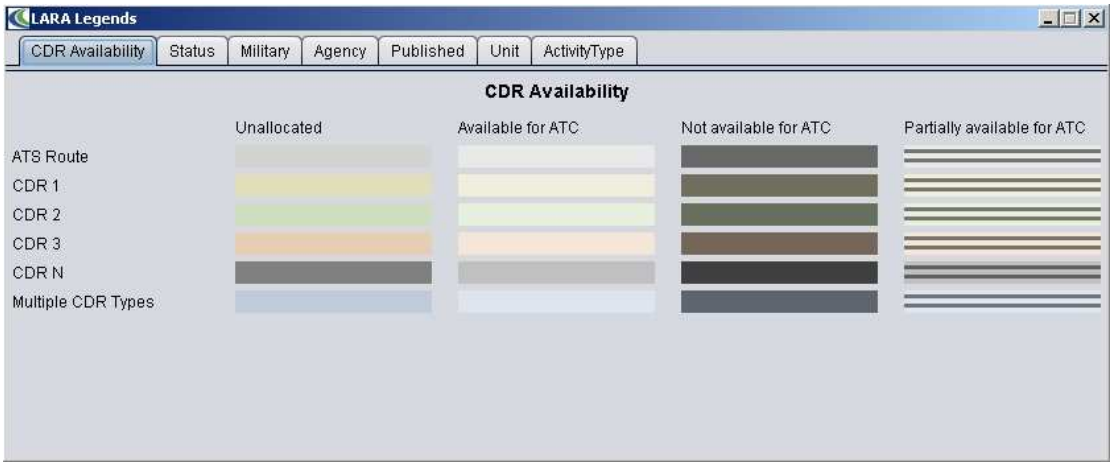
The background of the planning chart is colored according to a pre-defined logic: areas are colored according to their availability as specified in the national AIP. The published opening times of areas are colored light grey,

while the closed times are colored dark grey, which means the area is not available for reservations.



The background is colored to allow users to quickly identify certain type of areas and their opening times.

Conditional Routes are colored according to their type and their availability, e.g yellow for CDR Type 1, green for Type 2 etc. For details on color coding of CDRs, select “Help” from the menu bar and select “Legends”. The color coding of CDRs will change during the airspace management process – depending the publication of the airspace use plan (AUP/UUP). This will be explained in a separate section.

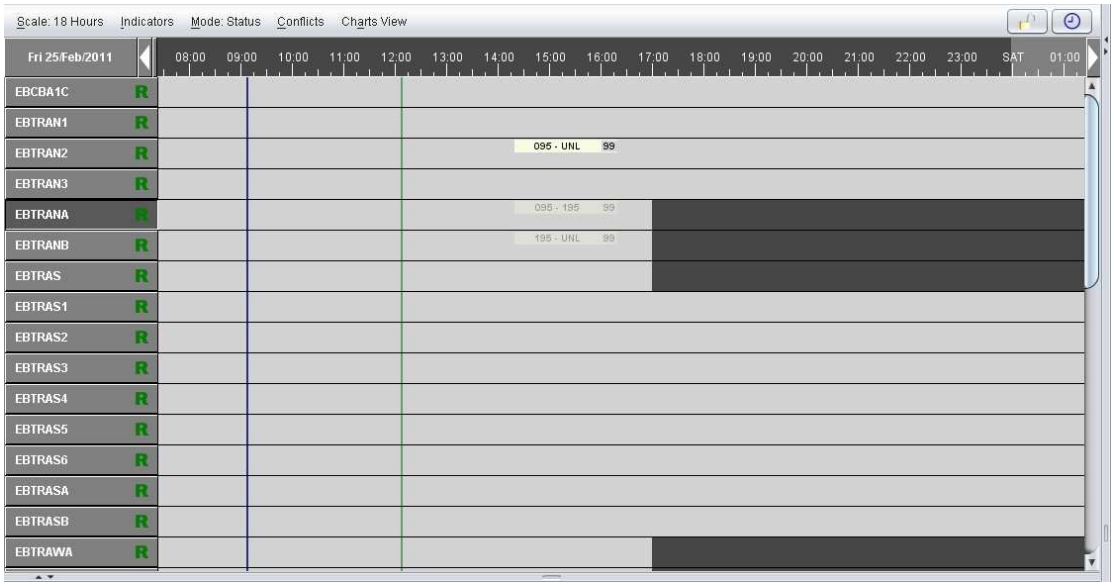


The Legend is accessible via the Help Menu and provides an overview over the colors used

4.1.7 Indicators used on the Planning Chart

The *Current Time Indicator* is a blue line running vertically through the Airspace Planning Display. It indicates current time.

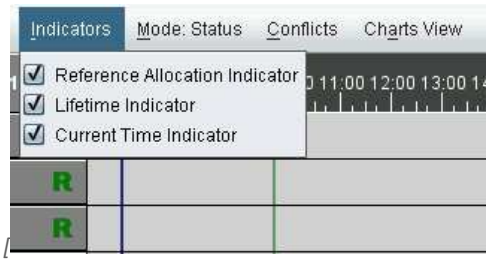
The *Reference Allocation Indicator* is a green line displayed vertically on the Airspace Planning Display. The Reference Allocation Time is set per airspace and is adjustable by the System's Housekeeper. It can either float a certain pre-defined amount of time ahead of the current time or it can be defined at a certain time of the day, e.g. every day at 06:00 a.m.



The APD showing the blue "Current Time Indicator" and the green "Reference Allocation Time Indicator"

The *Reference Allocation Time* marks the beginning of the consolidation period – reaching this line is marking the stabilization of the plan. Any changes are limited to a minimum to allow all parties involved a certain planning horizon. The Reference Allocation Time is agreed during Airspace Management Level 1.

A third indicator on the planning chart is the *Lifetime Indicator*. Every airspace defined in LARA has a specified lifetime with a given start and end date. The Lifetime indicator is a thin red line indicating on the planning chart when the lifetime of airspace ends and/or begins. Basically, every airspace has a definitive lifetime specified by the *AIRAC Cycle*. More details on airspaces and lifetimes can be found in the Housekeeping Section in the LARA Technical Manual.



The Indicators can be selected individually

All of the indicators can be switched on or off in the Indicators Menu on the Airspace Planning Display Menu Bar. If the checkmark is set the indicator will be displayed.

4.1.8 Set the time to current time

The clock symbol on the top right corner of the Airspace Planning Display will automatically move the timeline to the current time and position the current time indicator at the left edge of the planning display displaced by a certain amount to allow the user to observe the area left and right of the current time.

The "Current Time" Button

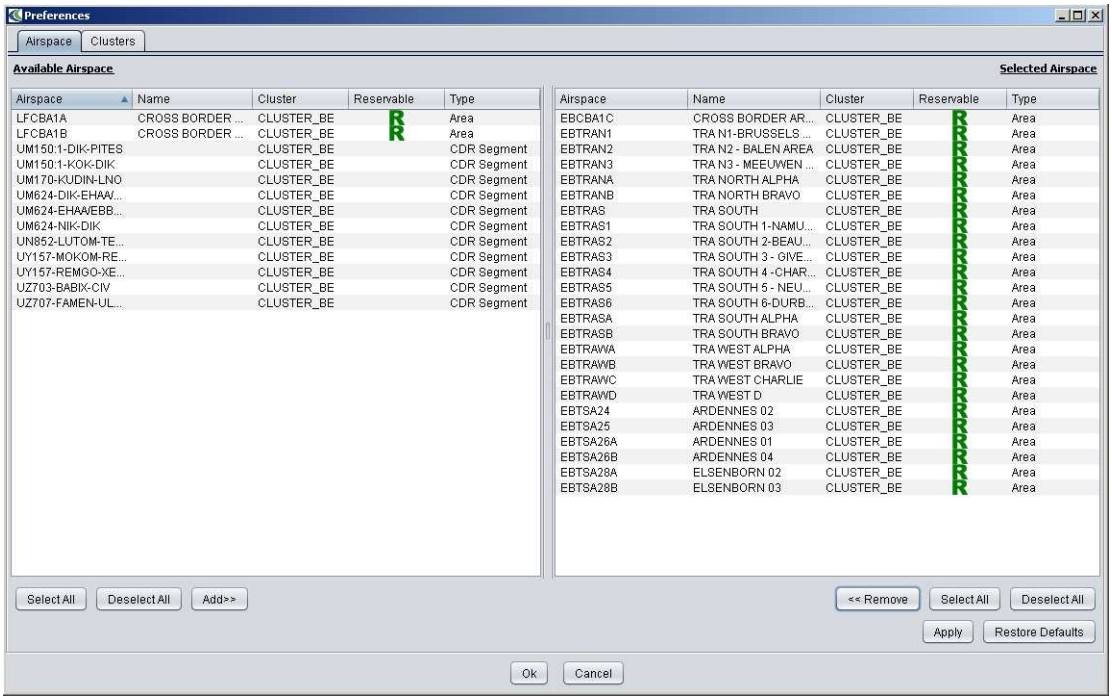
4.1.9 Lock-Button

Clicking this symbol will lock the display to the current focus, i.e. the planning chart will move with time keeping the focus on the selected time. The effect of this button will only be observable after some time – when the Planning Display has moved at the same pace as the actual time. In case the Lock Button is set, the lock within the button will appear closed.

The "Lock Planning Chart" Button

4.1.10 Preferences Window

The list of airspaces displayed on the Airspace Planning Display is manageable by the user. Select on the Menu Bar *Window* and then select *Preferences.* This will open the Preferences Window.



The "Preferences Window" showing the airspaces selected for display

The preferences window is composed of two tabs;

- *Airspace Tab*; allowing the selection and sorting of airspaces to be displayed on the planning display
- *Clusters Tab*; for managing connection to foreign clusters if available

By default, the Airspace Tab will be open initially to manage the list of airspaces. The window is split in half: the right side is called *Selected Airspace* and lists all airspaces, which have been selected for display on the Planning Chart. The left side of the window is called *Available Airspace* and lists airspaces that are available, but have not been selected for display.

The columns provide additional information per airspace:

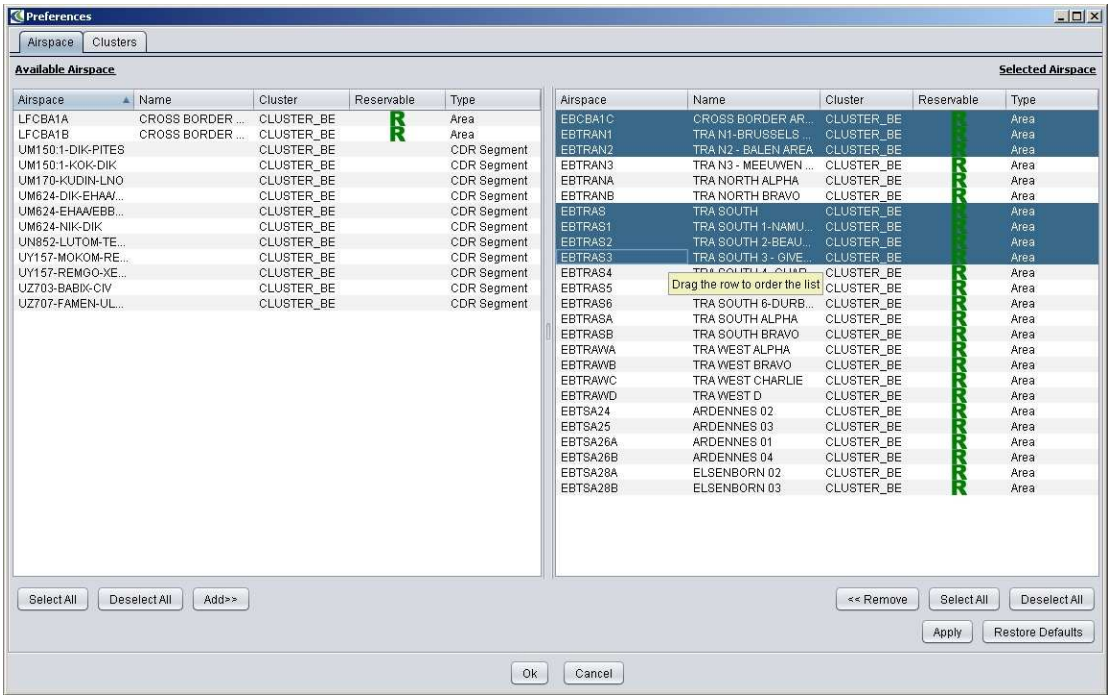
- ICAO abbreviation of the airspace
- Full or local airspace name
- Cluster of origin
- Reservable by the current user or not
- Type of airspace (Area or CDR Segment)

4.1.11 Selecting the Airspaces to be displayed on the Planning Chart

To move an airspace from the *Available Airspace Window* to the *Selected Airspace Window* – and eventually to display it on the Airspace Planning Chart - select an airspace on the Available Airspace Window and click the *Add>> Button*. This will move the selected airspace to the bottom of the Selected Airspace Window.

In order to remove an airspace from view, select the airspace on the Selected Airspace Window and press the << Remove button.

The system allows the selection of multiple airspaces by either using the Select All buttons or by ctrl- and/or shift-clicking[4] multiple airspaces.



Multiple airspaces can be selected to organize the Planning Chart more efficiently

4.1.12 Sorting Airspaces displayed on the Planning Chart

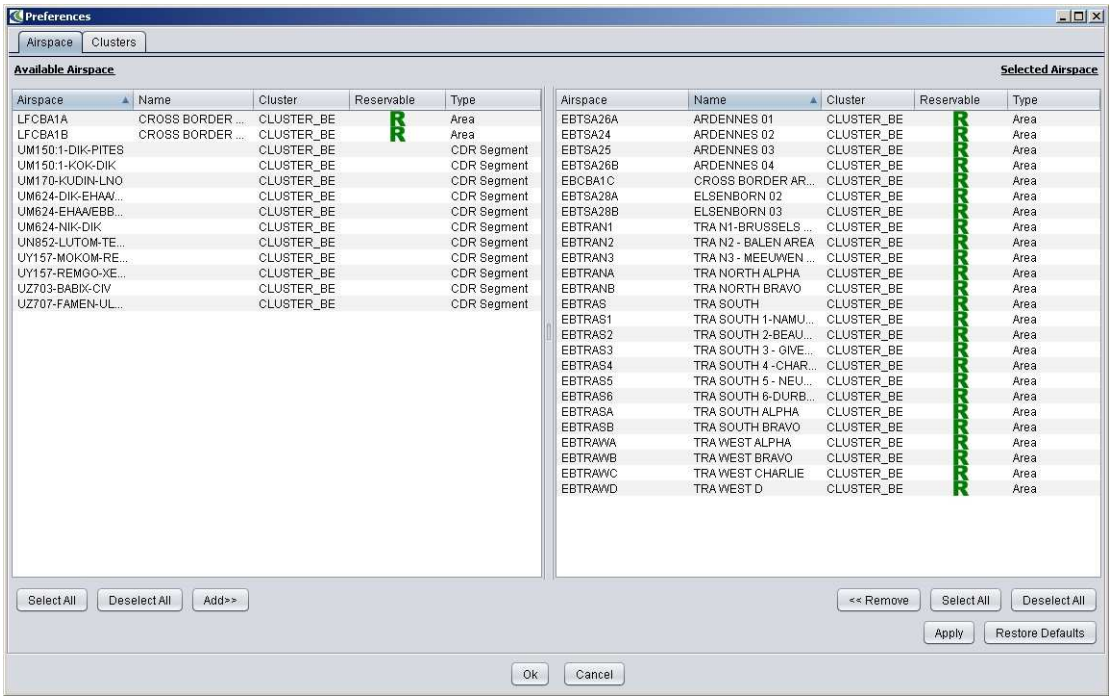
The sequence of airspaces found on the Selected Airspace Window is identical to the sequence of airspaces displayed on the Airspace Planning Display, i.e. changing the order of airspaces here, will change the order of airspaces on the Airspace Planning Display accordingly. This allows each user to select the order of airspaces in line with operational preferences and requirements.

One way to change the sequence is sorting the entries automatically by clicking on one of the column headers on top of the display. Clicking on the

[4] These short cuts are used within the Windows OS. These key-combination will be different on MacOS and Linux.

Airspace Column Header will sort the airspaces alphabetically by Name. The same applies in a similar manner when clicking on the other column headers. Click again on the header to reverse the sorting logic indicated by the direction change of the small arrow on the right side of the column header.

To change the order individually, select one or more airspaces on the Selected Airspace Window. Thereafter click on one of the selected airspaces and keep the mouse button pressed while dragging the selection to the desired position in the list. A blue line will be visible indicating where the selection would be placed if the mouse button is released. The individual sorting of airspaces only works on the Selected Airspaces Window


Preferences
Airspace
Clusters
Available Airspace
Selected Airspace
Airspace
Name
Cluster
Reservable
Type
LFCBA1A CROSS BORDER ... CLUSTER_BE R Area
LFCBA1B CROSS BORDER ... CLUSTER_BE R Area
UM150:1-DIK-PITES CLUSTER_BE CDR Segment
UM150:1-KOK-DIK CLUSTER_BE CDR Segment
UM170-KUDIN-LNO CLUSTER_BE CDR Segment
UM624-DIK-EHAA/... CLUSTER_BE CDR Segment
UM624-EHAA/EBB... CLUSTER_BE CDR Segment
UM624-NIK-DIK CLUSTER_BE CDR Segment
UN852-LUTOM-TE... CLUSTER_BE CDR Segment
UY157-MOKOM-RE... CLUSTER_BE CDR Segment
UY157-REMGO-XE... CLUSTER_BE CDR Segment
UZ703-BABIX-CIV CLUSTER_BE CDR Segment
UZ707-FAMEN-UL... CLUSTER_BE CDR Segment
EBTSA26A ARDENNES 01 CLUSTER_BE R Area
EBTSA24 ARDENNES 02 CLUSTER_BE R Area
EBTSA25 ARDENNES 03 CLUSTER_BE R Area
EBTSA26B ARDENNES 04 CLUSTER_BE R Area
EBCBA1C CROSS BORDER AR... CLUSTER_BE R Area
EBTSA28A ELSENBORN 02 CLUSTER_BE R Area
EBTSA28B ELSENBORN 03 CLUSTER_BE R Area
EBTRAN1 TRA N1-BRUSSELS ... CLUSTER_BE R Area
EBTRAN2 TRA N2 - BALEN AREA CLUSTER_BE R Area
EBTRAN3 TRA N3 - MEEUWEN ... CLUSTER_BE R Area
EBTRANA TRA NORTH ALPHA CLUSTER_BE R Area
EBTRANB TRA NORTH BRAVO CLUSTER_BE R Area
EBTRAS TRA SOUTH CLUSTER_BE R Area
EBTRAS1 TRA SOUTH 1-NAMU... CLUSTER_BE R Area
EBTRAS2 TRA SOUTH 2-BEAU... CLUSTER_BE R Area
EBTRAS3 TRA SOUTH 3 - GIVE... CLUSTER_BE R Area
EBTRAS4 TRA SOUTH 4 -CHAR... CLUSTER_BE R Area
EBTRAS5 TRA SOUTH 5 - NEU... CLUSTER_BE R Area
EBTRAS6 TRA SOUTH 6-DURB... CLUSTER_BE R Area
EBTRASA TRA SOUTH ALPHA CLUSTER_BE R Area
EBTRASB TRA SOUTH BRAVO CLUSTER_BE R Area
EBTRAWA TRA WEST ALPHA CLUSTER_BE R Area
EBTRAWB TRA WEST BRAVO CLUSTER_BE R Area
EBTRAWC TRA WEST CHARLIE CLUSTER_BE R Area
EBTRAWD TRA WEST D CLUSTER_BE R Area
Select All
Deselect All
Add>>
<< Remove
Select All
Deselect All
Apply
Restore Defaults
Ok
Cancel

Airspaces can be sorted automatically – here alphabetically according to "Name"

4.1.13 Apply the changes

Pressing the *Apply Button* will change the Airspace Planning Display in line with the selected changes. The Preferences Window will stay open.

Pressing the *Ok Button* will apply the changes as well, but close the Preferences Window at the same time.

The *Cancel Button* will close the window without the changes taking effect.

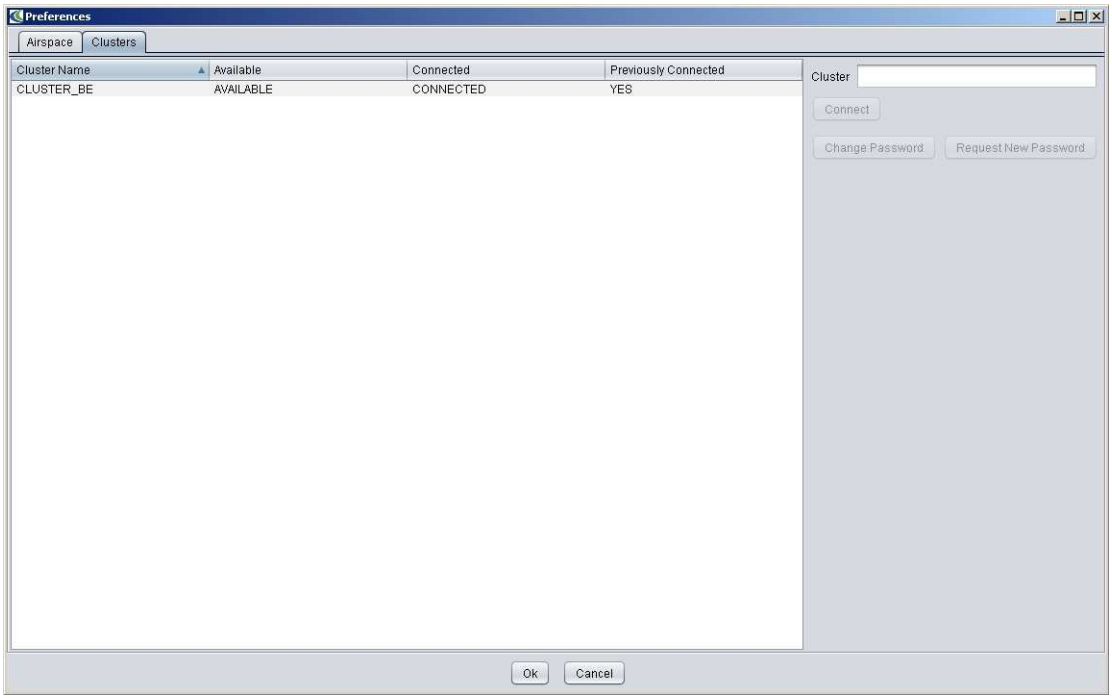
The *Restore Defaults Button* will revert the selection of airspaces to the situation found when opening the Preferences Window.

4.1.14 Connecting to foreign clusters

The second tab on the preferences window allows the connection to foreign clusters and adding foreign cluster airspaces to the Airspace Planning Display.

In order to enable the connection to a foreign cluster, two prerequisites have to be fulfilled

- the foreign cluster has to be connected to the local cluster
- the user has been granted access to the foreign cluster



The Clusters Tab allowing to connect to a foreign cluster

The Cluster Tab lists the local cluster and all clusters which are or have been earlier connected to the local cluster, providing information on the current connection status. If a cluster is marked as “Unavailable” the connection between the foreign and the local cluster is interrupted. Contact the LARA system administrator for more information on actual foreign cluster connections.

The *Connected Column* indicates if you are currently connected to a certain foreign cluster or not (indicated as disconnected).

In order to connect and login to a foreign cluster, select the cluster and press the connect button. A window will open asking for your password.

Note: this password is not necessarily identical to your initial LARA login password, as it might have been assigned by the foreign cluster administrator.

The *Change Password* and *Request New Password* functionality works as described in the section on starting the LARA Application.

After the correct password has been entered, the connection will be established and the data of the foreign cluster downloaded to your LARA Position.

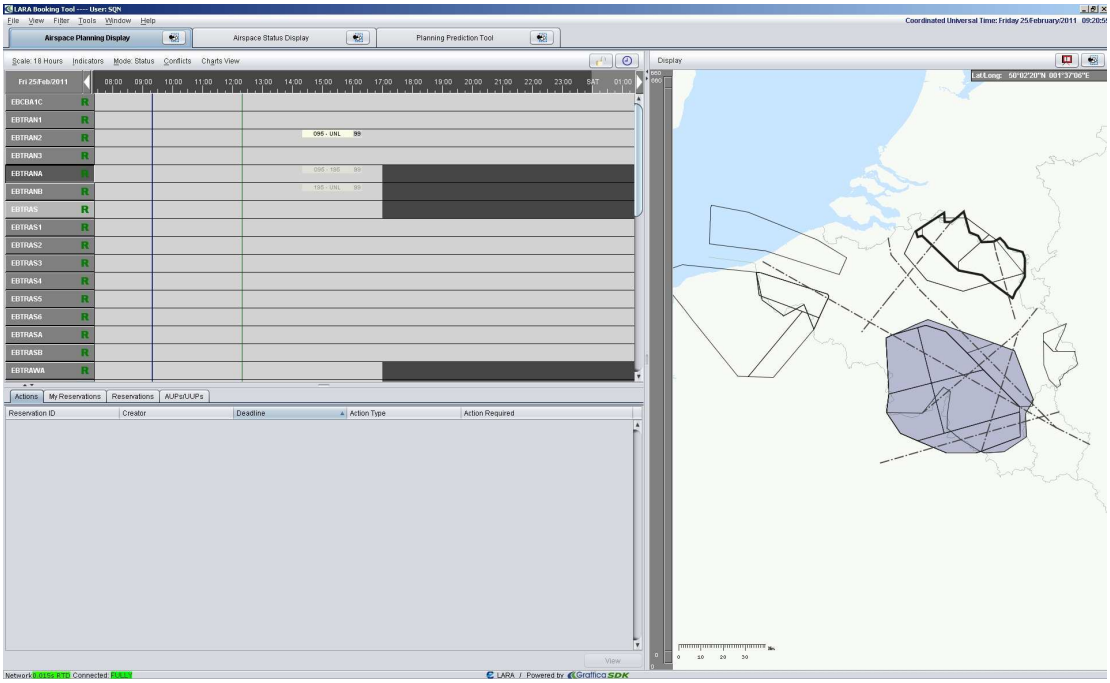
Switching back to the Airspace Tab of the Preference Window will show that the airspaces of the foreign cluster have been added and can be selected for display.

4.2 The Airspace Visualization Display (AVD)

The Airspace Visualization Display provides a geographical overview over the airspace used within LARA. This map can be configured according to user preferences and using a variety of filter settings explained in the following chapters.

The AVD is linked to the Airspace Planning Display (APD). If the mouse is hovered over an airspace on the area of interests it will be highlighted on the map display. LARA uses a different color coding depending on the type of airspace:

- Restricted Area in blue
- Segregated Areas in grey
- Danger Areas in red
- CDR Segments in red
- Prohibited Areas in yellow



Hovering over or clicking on an airspace on the Planning Chart will have an effect on the map view

When a user clicks on an airspace on the list of area of interests, the airspace will be displayed with an emphasized border on the map display. The Area of interest will display as selected (pressed and locked inwards).

The center of the map and the projection centre can be set for each LARA Working Position. Please refer to the LARA Technical Manual or contact the LARA Administrator for more details.

Navigation on the AVD is achieved by using the mouse.

- To zoom in or out of the map use the mouse wheel. Zooming in is done by moving the mouse wheel forward, zooming out by moving it backwards.

- To pan the map, click the middle mouse button / mouse wheel and move the mouse accordingly.

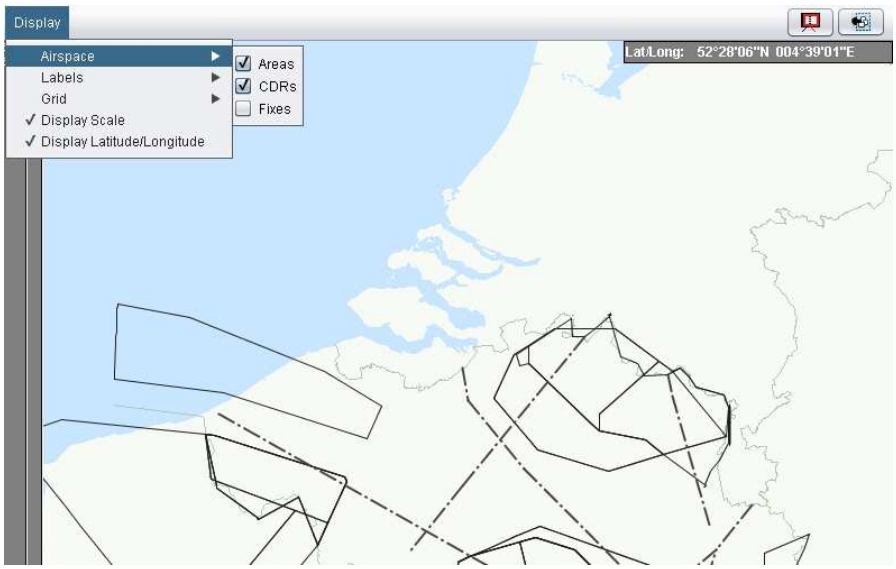
While zooming in and out you will notice that the scale display in the bottom left corner is updating accordingly.

The display in the upper right corner shows the Lat/Long Position of the mouse cursor as long as the mouse is hovering over the map display.

Both windows – scale and Lat/Long can be moved freely on the AVD using the mouse.

4.2.1 Airspace Display

The map display can be further configured by using the Display Menu at the top of the AVD. Selecting Airspace allows selecting which types of airspace to be displayed (Areas, CDRs, Fixes). Only checked airspace types will be displayed on the map.



The type of airspaces to be displayed on the map can be selected

4.2.2 Label Display

The Labels can be configured by using the Labels Menu Entry and selecting the way labels should be displayed for the different airspace types. The following options are available:

- *Display All*; all labels will be constantly displayed
- *Display None*; labels will not be displayed.
- Display On Highlight; labels will only be displayed when the mouse cursor is hovering over the respective airspace. Overlapping airspaces will trigger multiple labels to be displayed at the same time. For fixes the functionality works slightly different; clicking on a fix will display the label and keep it displayed until the fix is clicked again. This allows keeping important fixes displayed continuously and might enhance orientation on the map. If a fix is hidden underneath an area or a CDR Segment this functionality is not available.

The behavior and appearance of labels can be configured per airspace type

"Display on Highlight" is the default option for the label display for areas and CDR Segments. The labels for fixes are set to "Display None" as default.

4.2.3 Label De-confliction

A large number of labels in close vicinity will cause multiple labels to overlap and become unreadable. LARA offers two ways to de-conflict labels.

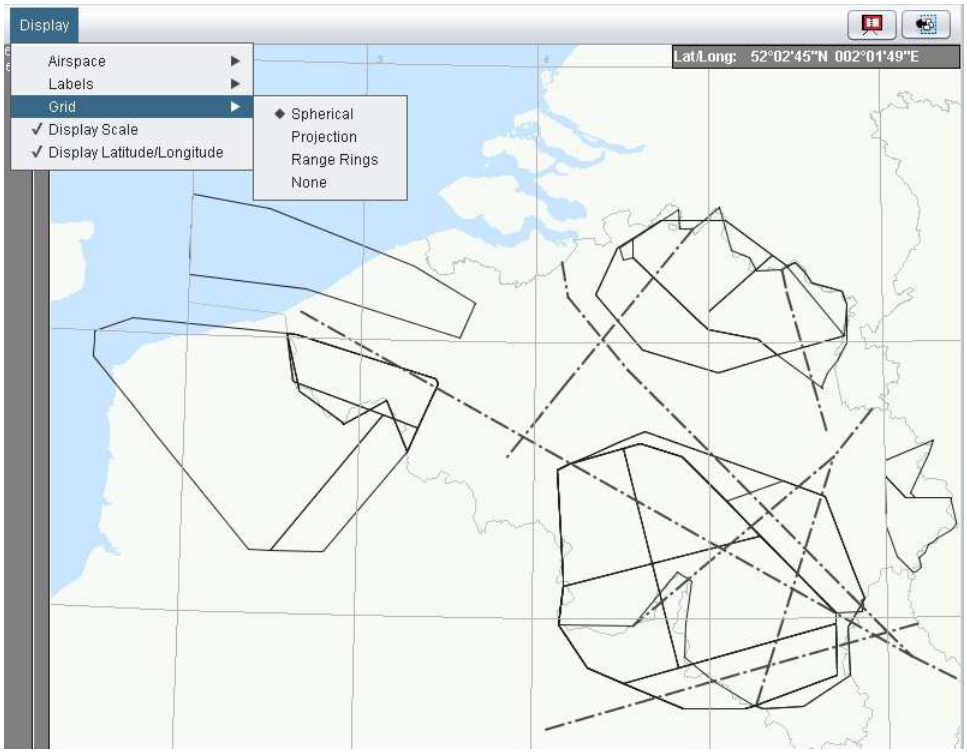
- The first option is to drag a label away from a cluttered area. Simply click on the label and move it to a better position.
- The second option is to select the *De-conflict Labels Button* on the top right of the AVD, which will rearrange the labels with the aim to de-clutter them as far as possible.

The "De-conflict Labels" Button

4.2.4 Grid Display

Three types of grids can be selected from the Display Menu;

- The Spherical Grid displays a Lat/Long Type of Grid on the AVD
- The Projection Grid super-imposes a grid system on the AVD, which centers around the projection centre defined for the LARA Client
- The Range Ring Option displays range rings around a defined centre point. The spacing of the rings is adjusted automatically depending on the selected zoom level.



The Spherical Grid is selected for display on the AVD

Furthermore, the Display Window allows selecting if the Scale Window and the Lat/Long Window should be displayed or not.

4.2.5 Altitude Filter

The AVD can be filtered according to altitude, which allows a user to focus on a certain part of the airspace structure, e.g. only to display airspaces in the upper airspaces or alike.

The Altitude Filter is located at the left side of the AVD and is turned off as default.

To activate it, select the lower and/or upper slider and adjust it to the desired position. The orange number next to the slider indicates the limit of the filter.

Note: the numbers are colored to clearly indicate to the user that the filter is in effect - a feature that is of utmost importance at a later stage when displaying real-time airspace status on the Airspace Status Display – more details in the chapter on airspace status.

The Altitude Filter is selected on the left side of the AVD

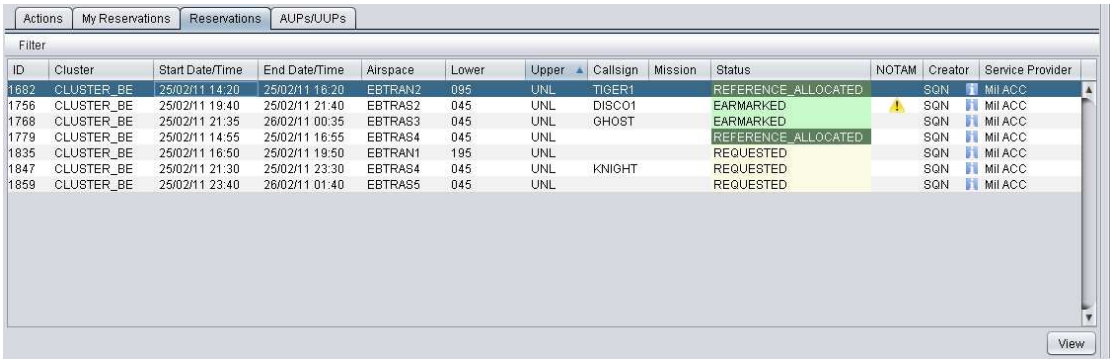
The filter takes effect as soon as the mouse button is released. To change the filter setting, adjust the lower and/or upper filter limit, or move the whole filter band to the desired position.

The AVD will display all those airspaces where at least one level is overlapping with the filter setting.

4.3 The Planning Information Display (PID)

The third main window of the Airspace Planning Display is the Planning Information Display – as a default this can be found below the Airspace Planning Chart. This window displays booking information in several different list views sorted and filtered according to user preferences.

The main role of this Planning Information Display will become apparent in the process of managing reservations, which will be explained in the following chapter.


Actions
My Reservations
Reservations
AUPs/UUPs
Filter
ID
Cluster
Start Date/Time
End Date/Time
Airspace
Lower
Upper
Callsign
Mission
Status
NOTAM
Creator
Service Provider
1682 CLUSTER_BE 25/02/11 14:20 25/02/11 16:20 EBTRAN2 095 UNL TIGER1 REFERENCE_ALLOCATED SQN Mil ACC
1756 CLUSTER_BE 25/02/11 19:40 25/02/11 21:40 EBTRAS2 045 UNL DISCO1 EARMARKED SQN Mil ACC
1768 CLUSTER_BE 25/02/11 21:35 26/02/11 00:35 EBTRAS3 045 UNL GHOST EARMARKED SQN Mil ACC
1779 CLUSTER_BE 25/02/11 14:55 25/02/11 16:55 EBTRAS4 045 UNL REFERENCE_ALLOCATED SQN Mil ACC
1835 CLUSTER_BE 25/02/11 16:50 25/02/11 19:50 EBTRAN1 195 UNL REQUESTED SQN Mil ACC
1847 CLUSTER_BE 25/02/11 21:30 25/02/11 23:30 EBTRAS4 045 UNL KNIGHT REQUESTED SQN Mil ACC
1859 CLUSTER_BE 25/02/11 23:40 26/02/11 01:40 EBTRAS5 045 UNL REQUESTED SQN Mil ACC
View

The Planning Information Display showing the "Reservations Tab"

The PID is composed of 4 different list view tabs:

- *Actions* – This tab displays all outstanding actions to be performed by the user. These can either be approvals of reservations or acceptance of proposals depending on the role in the approval chain.
- *My Reservations* - all reservations that were inserted by the logged-in user are listed here.
- *Reservations* – all reservations present in the system are listed here.
- *AUPs/UUPs* – LARA supports the creation of AUPs and UUPs . These are stored on the LARA Server and are accessible from this tab. More details on AUP functionality in a separate chapter.

4.4 Changing the Window Layout

The layout and combination of windows on the Airspace Planning Display can be adjusted to suit personal taste and operational requirements. The following means are available:

- Via the View Option from the Menu Bar. The user can select where the map should be positioned: on top, left or right. The other windows will take their position accordingly.

Changing the layout of the HMI via the View Menu

- By increasing/decreasing the size of the individual windows. The borders between windows show a handle that can be used to adjust the relative size of individual windows. This functionality cannot be used to close a window completely – a certain portion of each window will still be visible.

- By maximizing individual windows using the arrow symbols situated on the window borders. The arrows are displayed as pairs – pointing in opposite directions. Clicking one of these will maximize one of the two windows to a maximum and thereby closing the other one. The direction of the arrow indicates in which way the window border will move. After having closed one of the windows it can be opened again, by using the opposite arrow.

These arrows are found between the different windows and can be used to maximize a window

- By undocking tabs or part of windows using the *Panel-Tear-Off Buttons*. These allow separating windows from each other to either minimize them or dragging them to a separate screen for better viewing. This would allow e.g. to use one screen to display the Airspace Planning Display and another screen to display the Airspace Status Display for full awareness of both phases of airspace management. Closing a torn-off window will put it back in place on the original default HMI.

The Tear-Off button to split the HMI into separate windows

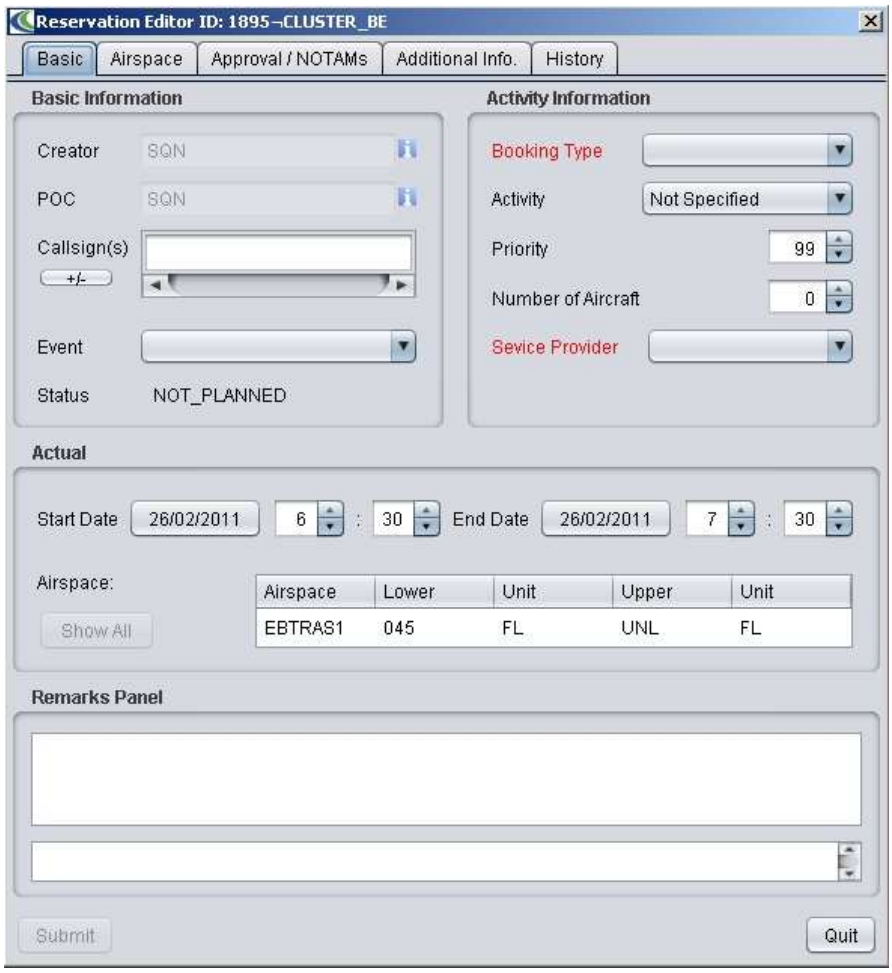
Any change to the layout can be undone by selecting *View → Reset Chart* Layout from the Menu Bar. This will revert the layout of the HMI back to the default; except for changes to the layout by defining the map position (option a).

4.5 Airspace Reservation Editor (ARE)

In order to introduce a reservation in LARA the user has to open an airspace reservation editor to specify the required details for a reservation.

To make an airspace reservation in LARA, select the appropriate date and time for display on the Airspace Planning Chart and scroll to the appropriate airspace. Now position the mouse over the appropriate row for the desired airspace and roughly on the correct start time and click the Right Mouse Button.

The Airspace Reservation Editor will open with the correct airspace and start time already pre-set. At the same time, a tentative booking slot is already placed on the Airspace Planning Chart.

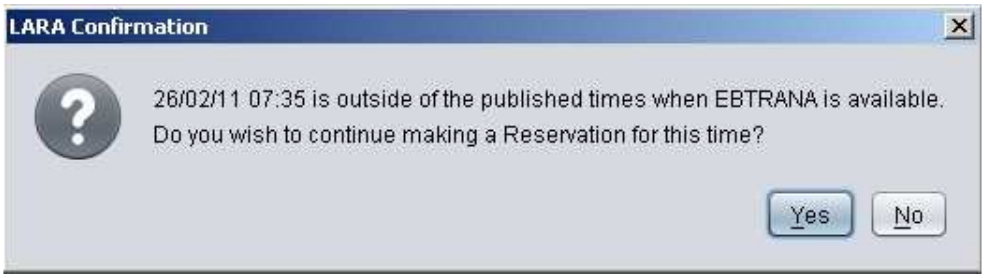


The Basic Tab of the Airspace Reservation Editor (ARE)

Note: LARA checks the validity of reservations instantly. If you try to open an ARE for a time in the past or for an airspace you may not reserve, you will be informed accordingly and a reservation request will not be allowed.

LARA Warning Message
Cannot create a Reservation for Airspace EBTRAN3 with a start time of 25/02/11 10:03 as it is in the past.
OK

If your reservation will be in conflict with another reservation or is reaching beyond the published opening times, LARA will warn you, but you may ignore the warning and submit the request to the system.


LARA Confirmation
26/02/11 07:35 is outside of the published times when EBTRANA is available.
Do you wish to continue making a Reservation for this time?
Yes
No

The Airspace Reservation Editor will always stay on top of the LARA Airspace Planning Display.

The ARE is composed of several tabs and each tab is again subdivided in different sections. The following paragraphs will explain these in all detail.

4.5.1 The Basic Tab

When opening the ARE you are viewing the Basic Tab – allowing you to insert and review all required information for your reservation.

Basic Information

The Basic Information Section of the Basic Tab

- C*reator*: this field is automatically filled by LARA and is not editable. It provides information to the system and other users who has created this reservation.

- *POC*: Point of contact for this reservation. Next to the Creator and Point of Contact a blue "I" is displayed. Clicking on it will make additional contact information available.

- *Callsign(s):* Allows specifying one or more callsigns for the reservation. Multiple callsigns can be typed directly in the text field separated by semicolon or alternatively, added by pressing the +/- button and adding or removing callsigns from the list by using the add/remove button. To *remove* select the callsign from the list and select remove. To add, type the callsign in the text box and press *"add".* Press OK to accept all changes and close the window, press "cancel" to discard the changes while closing the window.

Entering callsigns for a reservation

- *Event*: LARA features *Event Management Functionality*, which is explained in more detail in the Event Management Chapter. If this booking is part of an Event that is being managed in LARA, the reservation can be linked to this event by selecting the event from the dropdown menu. Respectively this specific reservation will be listed in the Event's reservation list .

- *Status*: this is automatically inserted by LARA in line with the configuration specified by the *LARA System Administrator*. As this reservation is still in the process of being submitted, the status is *NOT_PLANNED*.

Activity Information

Activity Information Section of the Basic Tab

- *Booking Type:* the booking type specifies the general purpose of the airspace reservation request. The list of booking types is a standardized list in LARA and cannot be adapted by the local Housekeeper. The Housekeeper can however limit the available booking types per area. To select the booking type for the booking, use the displayed drop-down menu. Booking types are a mandatory field in LARA and are therefore displayed red until specified. Booking types are not only displayed for informational purposes; the booking type can influence the approval chain for a booking. In our current used for producing this user manual, all reservations with the booking type AD (Air Defense) will have to be accepted by the controlling Air Defense Unit (CRC). The details of the approval chain will be discussed in a later chapter. All booking types are identified as either military or civil in nature and will have an effect on the availability of the Mission Tab and the Service Providers.

The following booking types are available:

- AAR – Air-to-air Refueling (mil)
- AD – Air Defense (mil)
- ATC – Air Traffic Control (mil)
- OTHER_CIVIL (civ)
- OTHER_MILITARY (mil)
- PCA – Prior Coordination Area (civ)
- RCA – Reduced Coordination Area (civ)
- RVA – Radar Vectoring Area (civ)

For CDRs only one booking type is available:

- CDR – Conditional Route (civ)

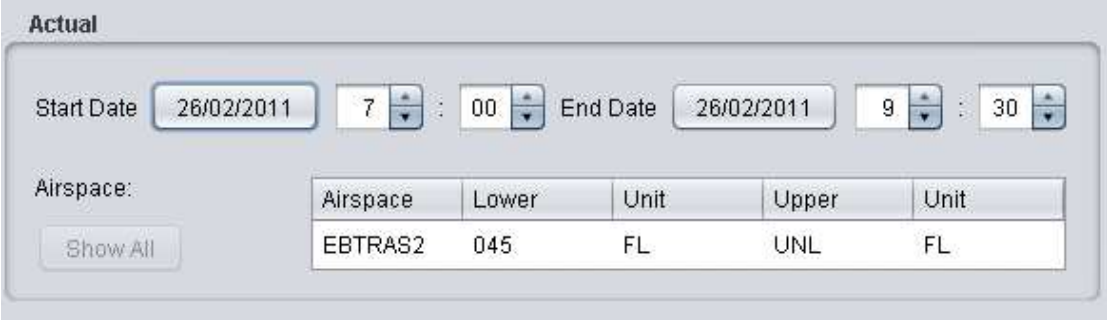
- *Activity and Priority:* these two fields in the Airspace Reservation Editor are linked logically. Activities in LARA are defined by the Housekeeper in the LARA Database and provide more detailed information on the usage of the area or CDR. Each activity is linked to a certain priority. If the user selects an activity, the priority will be selected automatically. If however, the user has good reasons to request a higher priority, the priority field is editable. If no activity is specified, the priority field is automatically set to the lowest priority. The priority and activity setting itself have no direct effect on any system logic of LARA. It merely provides information to decision-making-users throughout the airspace management process.

- *Number Of Aircraft*: Specify the number of aircraft using the area. The minimum and maximum number of aircraft selectable is specified by the LARA System Administrator.

- *Service Provider*: The service provider is one of the mandatory fields of the Airspace Reservation Editor and is colored red until specified. The list and responsibilities of service providers are managed by the LARA System Administrator. Based on these settings, LARA automatically detects which service providers are available for a certain Booking Type / Airspace combinations. Consequently, as long as no Booking Type is selected, the list of service providers will remain empty. The selected Service Provider can as well have an influence on the approval chain and determines the responsible supervisor for this reservation, which

can have an impact on the actual activation of the airspace volumes later in the process.

Actual



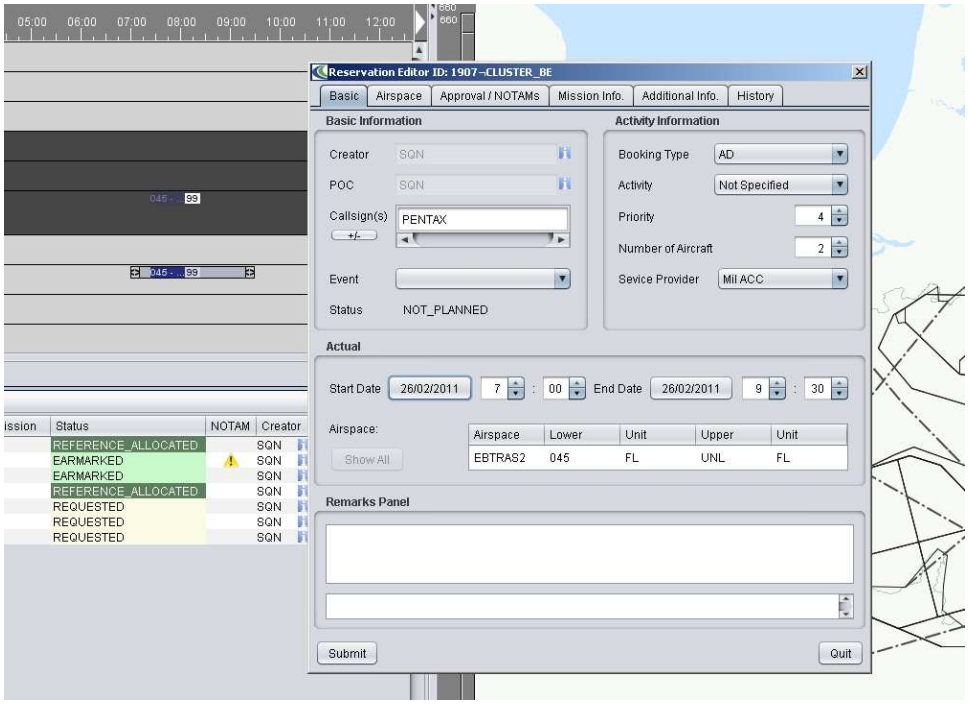
Actual Section of the Basic Tab

This section can be considered the core of the ARE – here the user determines the actual requested airspace in lateral, vertical and temporal limits.

- *Start Date*: The figures for the start date and -time have already been set by opening the ARE with a right mouse button click on the appropriate time on the Airspace Planning Chart. It should however be checked as – depending on the scale setting - the selection via the Planning Chart can be quite rough. Clicking on the date will open a calendar window allowing to select a date. The time can be dialed in via the arrows for hours and minutes individually. The minutes will advance/decrease in 5 minute increments – more exact figures can be inserted via the keyboard if required. The date, hours and minute fields are linked to each other: advancing the minutes beyond 55 will advance the hour by one accordingly. Same for the date: if the time is advanced beyond 23:55, the date will advance to the next day. It is not possible to enter a start time in the past – the start time of the reservation has to be at least 5 minutes in the future. The *Start Date* will turn red if this is not the case.

- *End Date:* The buttons, windows and logics work exactly like for the Start Date. When opening the ARE, LARA defaults to a duration of one hour for the reservation. Adapt these figures as required. LARA will only accept an end time which is at least 5 minutes beyond the start time. The minimum time for a reservation in LARA is therefore 5 minutes.

Note: Times can be edited by dragging the reservation symbol on the Planning Chart as well. The numbers in the actual field will update accordingly. The user can drag the start time or end time individually or drag the complete booking bar, which will keep the duration of the reservation, but change start and end time accordingly.



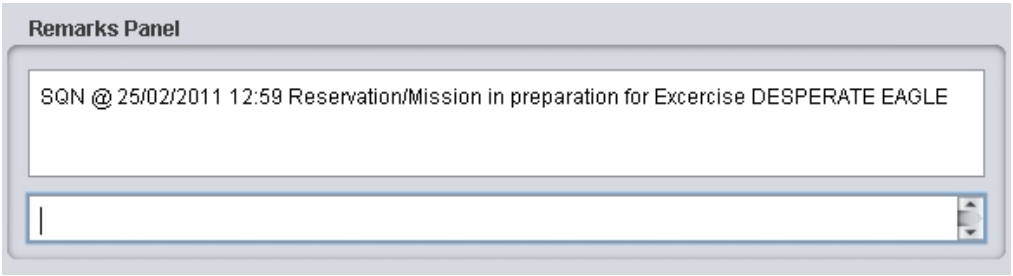
Setting the times by dragging the reservation bar on the Planning Chart.

- *Airspace:* The Airspace table shows the selected airspace and the selected lower and upper levels. LARA defaults to the lowest and highest levels available for each airspace. The user can change the levels by using the arrow buttons next to the level figures or by typing the actual levels into the field. LARA accepts entries as Flightlevels or Altitudes with the minimum increment possible being 500ft. In order to change a value from FL to Altitude or vice versa, first change the Unit field appropriately and then the figure itself. Flightlevels will be expressed in hundreds of feet, altitudes in feet with a preceding capital A, e.g 245 is a vertical limit expressed in flight levels (FL) and A24500 an altitude expressed in feet. LARA will validate all entries and will not allow selections outside the minimum and maximum levels defined for this airspace. A lower limit higher than the upper limit will also not be tolerated; the entries will be displayed in red in case of any invalid figures. LARA allows a more sophisticated means of selecting of airspaces if required via the Airspace Tab, e.g. multiple airspaces can be added into one larger airspace volume. More details on this later in this chapter. If more than one airspace have been selected, these can be viewed by pressing

the “Show All” button. This opens a table, which allows viewing the selected airspaces and changing the lower and upper limits. To close this table, click the “Hide” Button or click outside the table area.

Note: LARA supports the use of Altitudes and Flightlevels, however, LARA is not aware of local air pressure and cannot calculate the true relationship between FL and Altitudes selected here. LARA will always assume standard pressure of 1013,25 hPa and calculate conflicts accordingly, i.e. for LARA FL070 and A7000 is the same.

- *Remarks Panel: T*his panel allows adding comments to the reservation. The comments can be inserted during the initial reservation request or later during the approval process by eligible users. The lower field of the panel is for entering the comment, the upper part will display previously entered comments if available. The comment will be saved and taken into account as soon as the *Submit* button is pressed. The comments will be listed in the upper window with a tag specifying the originator of the comment with a date/time stamp, example:



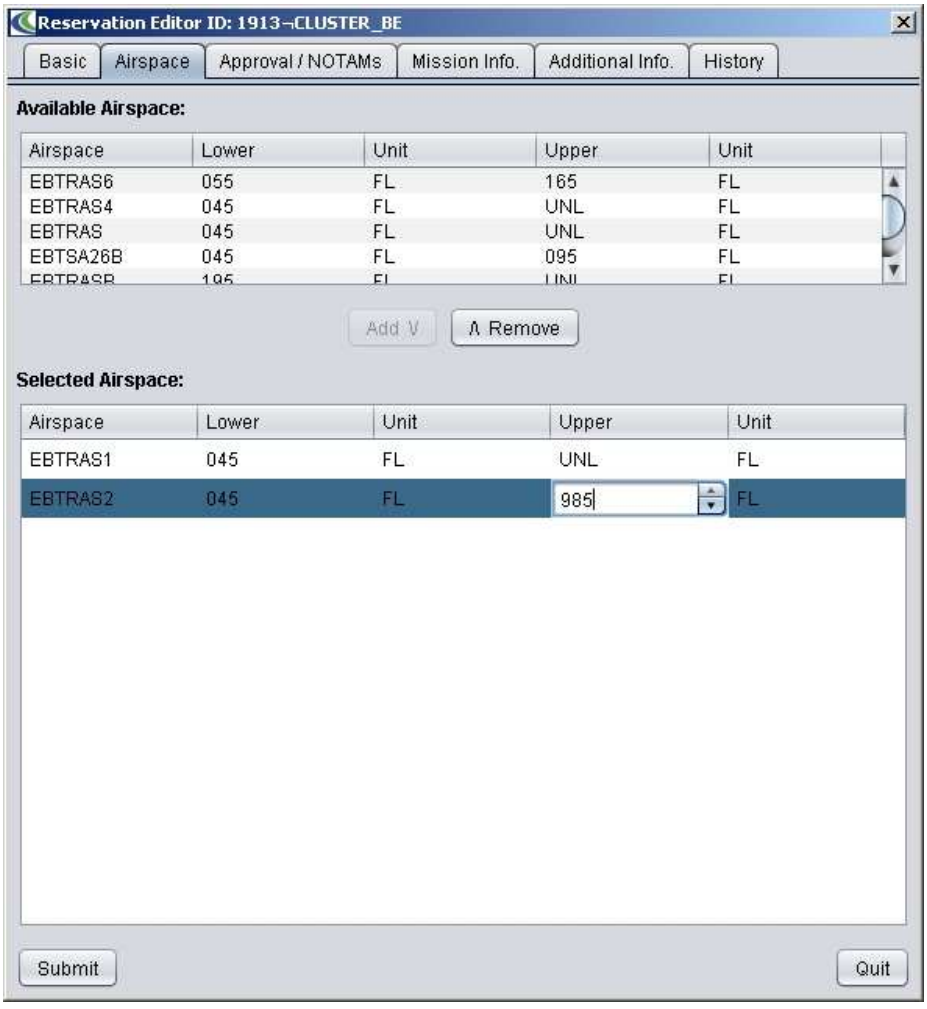
Adding a remark to a reservation

This concludes all entries that are available on the Basic Tab. Click the button “Submit” at the bottom of the ARE to submit the reservation to the server. The server will process, validate and determine the correct status for the reservation and all connected clients (including your own) will display it accordingly – a process that normally takes only a fraction of a second. The alternative is to press the “Quit” button. This will close the ARE without saving or submitting the information.

The reservation is now visible on the planning display as a reservation bar colored according to its status. This reservation is now subject to further processing along the approval chain, which will be covered in all details at a later stage.

Note: LARA only needs basic information to manage a reservation. Many of the previously discussed items on the Basic Tab are not required for LARA to accept and manage the airspace reservation properly. Mandatory items are: the airspace with its levels, start- and end time, booking type and service provider – after specifying these, the reservation is ready for submission. Additional information like callsign, activity, remarks, number of aircraft serve two purposes: Firstly, they allow other parties to make use of this information for operational purposes during the planning and execution phase. Secondly, they allow LARA to produce valuable statistics on airspace usage for national use and/or for an automated feed of PADAC/PRISMIL if applicable.

4.5.2 The Airspace Tab



The Airspace Tab of the Airspace Reservation Editor

In case the airspace selected for this airspace booking has adjacent and/or overlapping airspaces, they can be viewed and added on the Airspace Tab of the Airspace Reservation Editor. The tab is divided into an upper section listing all adjacent airspaces including their lower and upper limits and a lower

section displaying the already selected airspace. In case the upper section is empty no adjacent airspaces are available.

Note: The LARA Housekeeper has the option to review and change the settings for adjacent airspaces.

To add one or more airspaces to the reservation select these in the Available Airspace Section by clicking on one or more airspaces (via the ctrl/shift-click functionality[5]). After the selection is complete, press the “Add” button to move them to the Selected Airspace. Once an additional airspace is added to the reservation, all adjacent areas of this airspace will become available in the upper window causing the list to grow.

Airspaces can be removed from the current selection, using the same technique: select the airspaces and click the “Remove” button. It is as well possible to remove the airspace that was originally selected for the reservation and replace it by one of the adjacent airspaces. However, LARA does not allow the “Selected Airspace” Window to be empty. In order to change the airspace first the new airspace has to be added, before the original airspace can be removed.

When airspaces are added or removed from a reservation, this is immediately reflected on the Planning Chart.

Once the adjacent airspaces are finally selected, the lower and upper limits of each selected airspace can be adapted if required. The functionality works as described for the Basic Tab.

[5] These short cuts are used within the Windows OS. These key-combination will be different on MacOS and Linux.

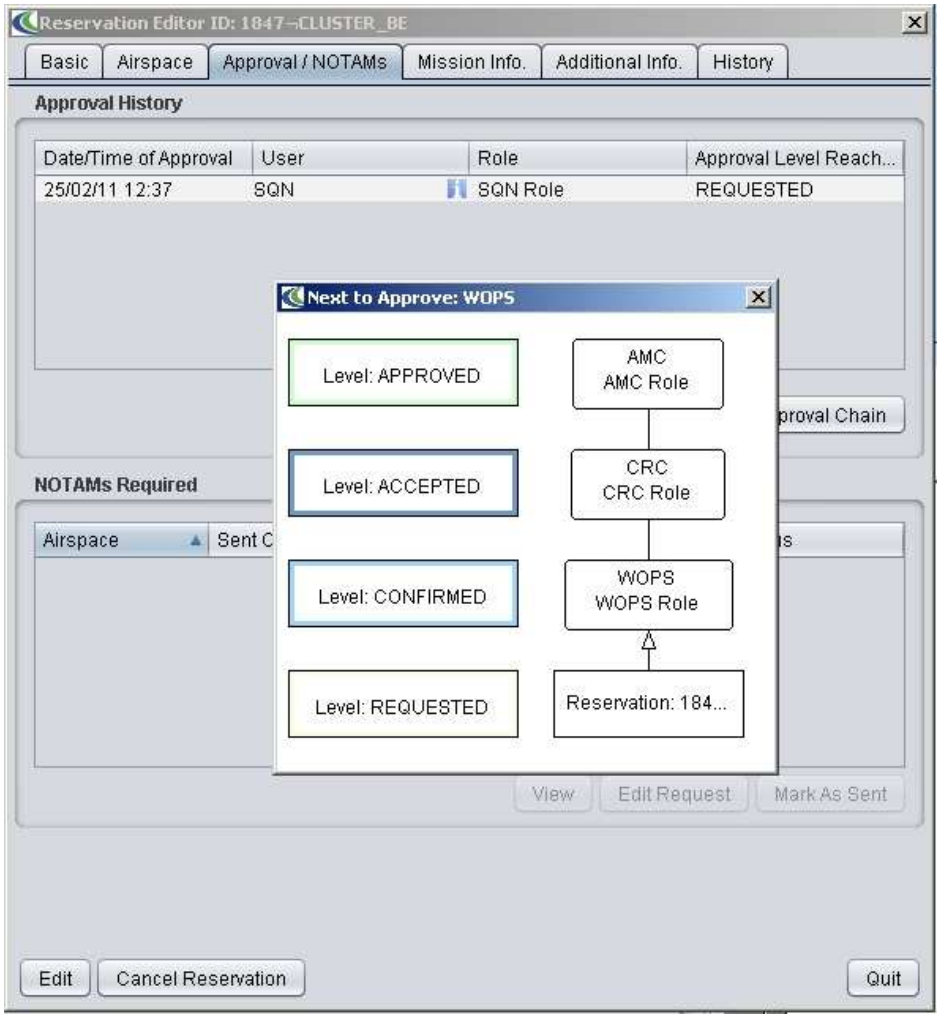
4.5.3 The Approval/NOTAMs Tab

The Approval/NOTAM Tab of the Airspace Reservation Editor

The name of the tab already indicates that it serves two purposes. The first is to show the progress of this reservation through the approval chain, the second to support the NOTAM publication if required.

The Approval History section of this tab consists of a list view indicating when, and who has approved the reservation. The button “Show remaining Approval Chain” will open an additional information window displaying the remaining approval chain to reach the final APPROVED Status.

Note: The Approval Chain will be explained in more detail in the section “Approval Chain”. This will include the various approval stati and the differences between approval groups, roles and users.



The Approval/NOTAM Tab showing the remaining approval chain

The reservation of some airspaces and/or the resulting closing of routes might require issuing a NOTAM. LARA supports the drafting of NOTAM Requests.

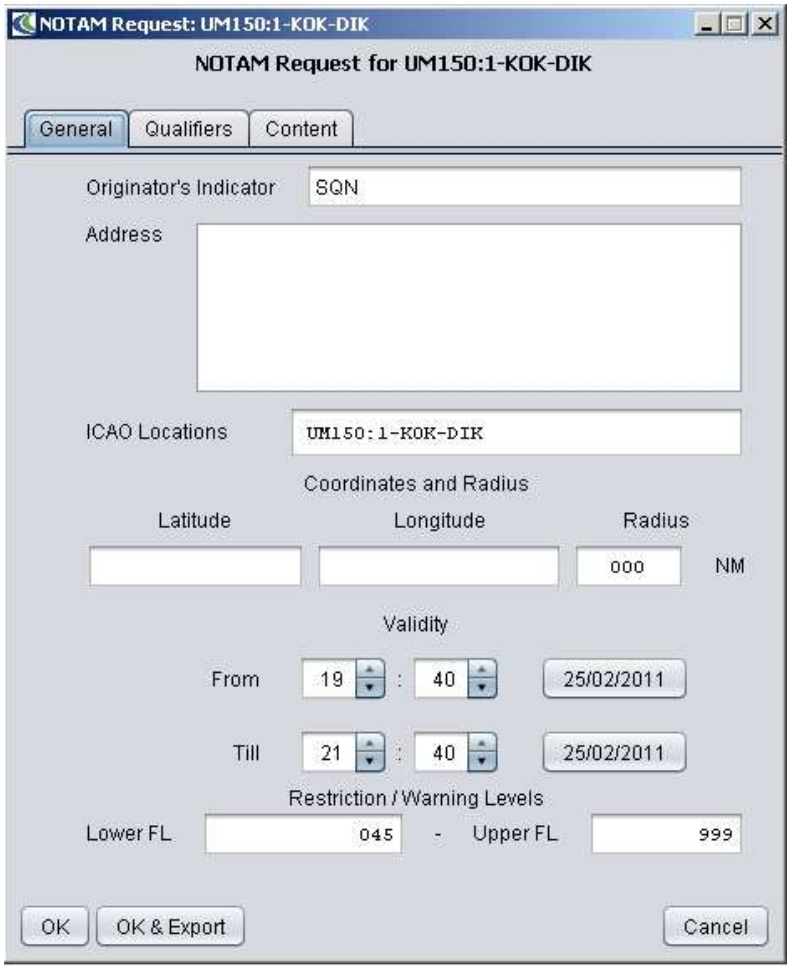
The LARA Housekeeper can define which airspaces require a NOTAM in line with applicable rules and regulations. The LARA Application will trigger related warnings and support drafting this NOTAM.

Whenever a reservation for an area requiring NOTAM publication becomes finally APPROVED, LARA will make the NOTAM request capability available and issue the appropriate warning. The Warning will be found on the Planning Information Display: the tabs “My Reservations” and “Reservations” feature a NOTAM Column. As soon as a NOTAM is required, a yellow exclamation mark symbol will be displayed until the NOTM is being taken care of.

The applicable airspaces will be listed on the Approval/NOTAMs Tab in the NOTAMs Required section.

The user will find buttons to “View” the current status of the NOTAM Request, “Edit Request” and “Mark As Sent” [6]

- The *View Button* will enable viewing the NOTAM Request Form in its current state. There will be no option to edit any fields.
- The *Edit Request* Button will open the NOTAM Request From in its present state and allow changes to the fields.



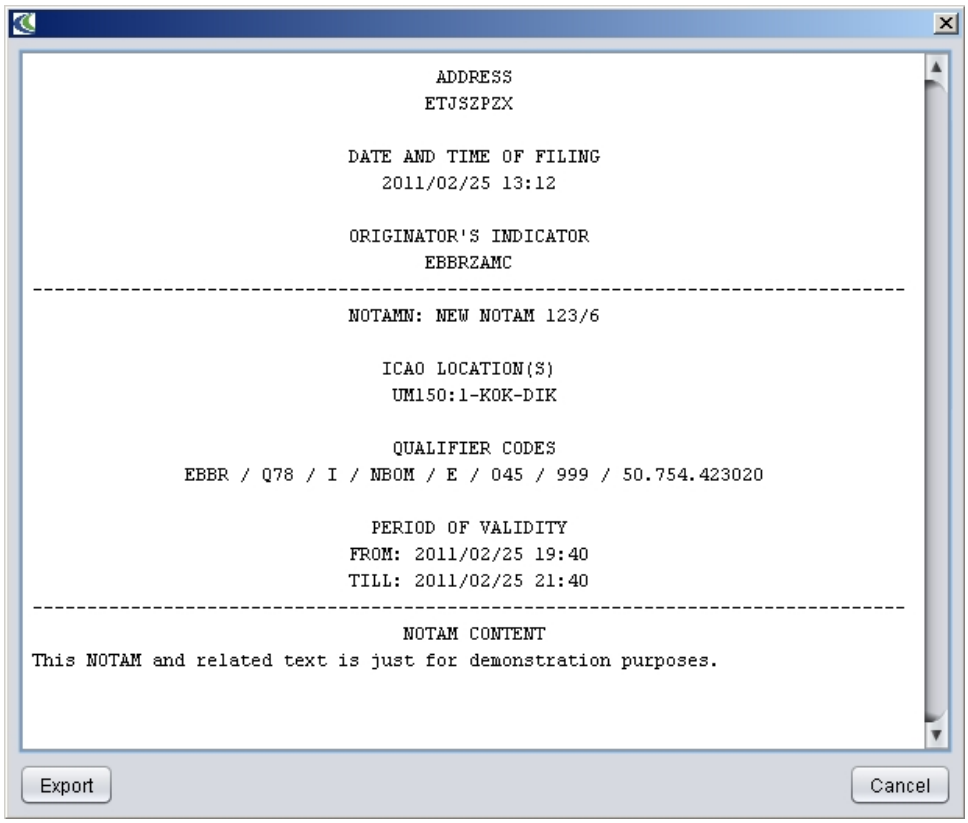
Editing a NOTAM Request in LARA

At the bottom of the NOTAM Request Window three buttons allow access to different functions:

- “OK” button will accept and save all changes made and closes the window,

[6] LARA does not interface directly with NOTAM Systems currently – however, a B2B interface with the future Airspace Data Repository (ADR) is foreseen. With this interface in place, NOTAMs can be handled online.

- “Cancel” button to close the window without saving any changes,
- “OK & Export” will accept and save all changes made, closes the window and opens the NOTAM Window – showing how the NOTAM will look in its present state.



NOTAM Draft produced by LARA just prior Export

From this window the user can export the NOTAM and save it to disk for further processing and relay.

The final button on the Approval/NOTAMs Tab of the Airspace Reservation Editor is the ”Mark as Sent” button. When this is pressed the LARA System will indicate on this tab, by whom and when it was sent. Additionally, the warning from the Planning Information Display will be removed – changing the exclamation mark symbol into a green check-mark symbol.

4.5.4 The Mission Info Tab

The Mission Tab will only appear on the Airspace Reservation Editor if a military Booking Type is selected. (See section on Booking Type Information above). This tab allows inserting and linking basic mission information to an airspace booking if applicable.

Note: If the booking type is changed to a civil Booking Type the Mission Info Tab will disappear – previously entered information will be retained if a military type is re-selected at a later stage.

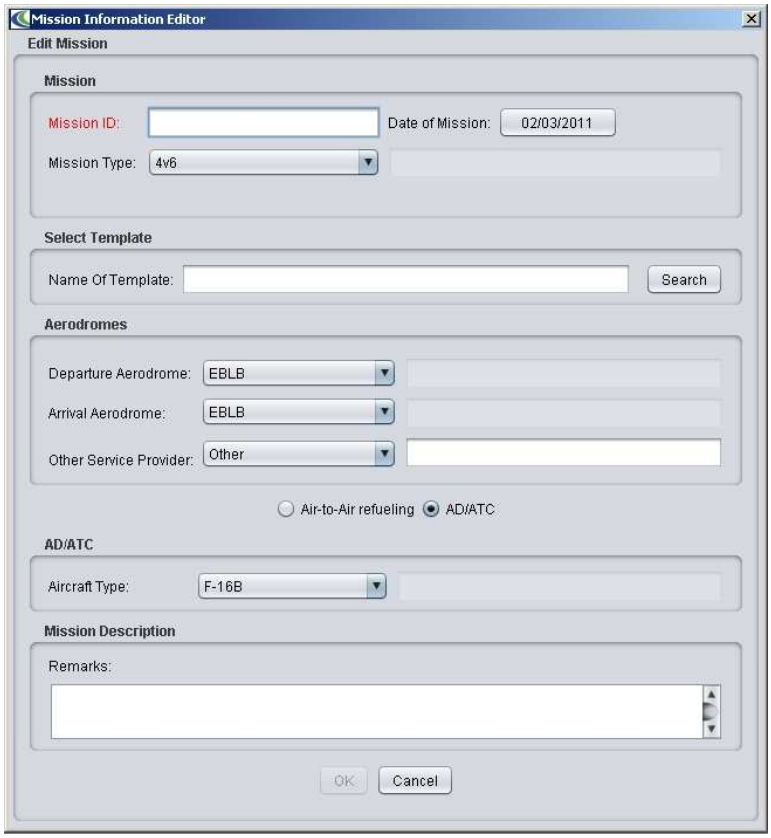
The information entered here is for informational purposes only – it is not required for LARA to proceed with managing the reservation properly. It can however be used to support decision making throughout the approval chain and to populate statistics.

Once a military booking type is selected the Mission Info Tab becomes available

To populate the Mission Tab with information there are two ways to proceed:

- Select a Mission ID from the drop down menu to use mission information that has already been inserted. After selecting a Mission ID the corresponding information is displayed in the fields of the Mission Information Tab. If the information is correct and applicable, the user can leave the mission tab and proceed with filing his reservation. By selecting the Edit Mission button the Mission Information Editor is opening, which allows changing the values.

- The second option and most probably the more common one is selecting Create New to insert mission information from scratch. The Mission Information Editor is opening on top of the Airspace Reservation Editor awaiting mission information entries from the user.



The Mission Information Editor allows inserting and editing mission information

Note: The Mission Functionality in LARA distinguishes between Mission IDs and Mission Templates.

Mission IDs are considered unique for any one day, i.e. a Mission with the ID 1 is unique for today, while for tomorrow a Mission with the ID 1 can have completely different mission details. Mission IDs are used to identify a single mission without ambiguity by combining mission ID and Date of Mission. For this reason the Mission IDs selectable from the Mission ID dropdown window will only list Mission IDs from the same day. Mission ID is the only mandatory field relating to missions.

Mission Templates are generic missions that can be re-used at any time. Combined with a Mission ID they will form a unique mission. Mission Templates can be inserted and edited by using the Mission Management Tool. More on this functionality can be found later in this chapter.

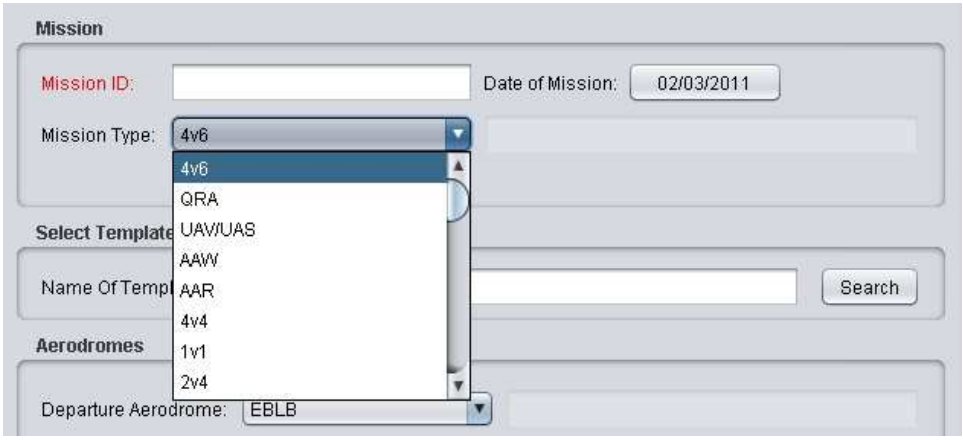
The following fields are available in the Mission Information Editor:

- Mission ID is any combination of numbers, letters and signs with a maximum of 20 characters. In case mission information is to be entered for a reservation, this entry is mandatory. It is used to uniquely identify a mission. For more information see the note above.

- Date of mission is automatically pre-set to the date of the reservation. In case there is a mismatch between the date of the reservation and the date of the mission the system will display a warning on the Mission Tab. This can be triggered by choosing a different date on the Edit Mission Information Tab or by moving a reservation to a new date after it has been originally submitted with mission information attached.

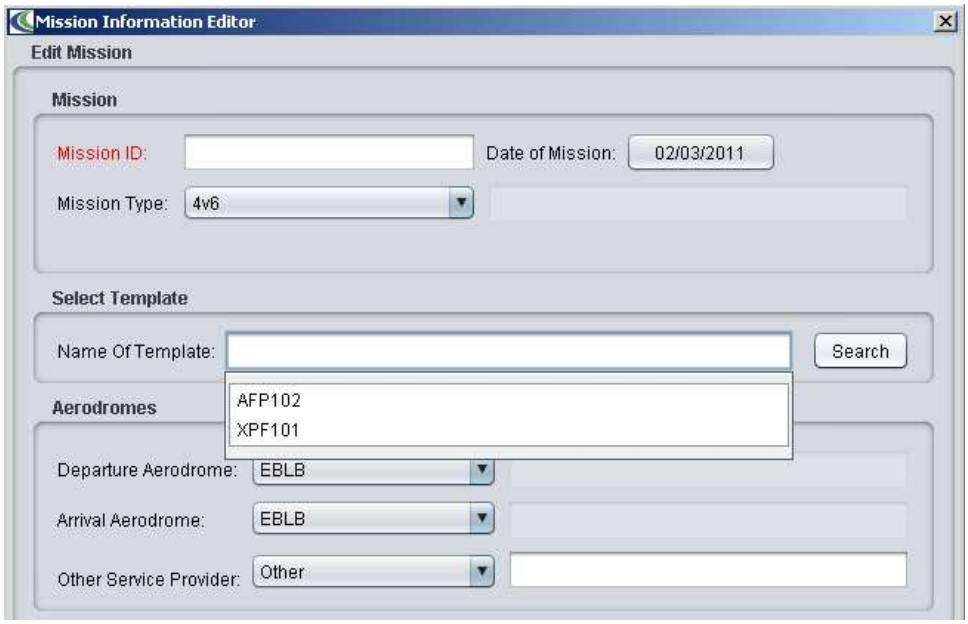
Warning message in case mission date and reservation date do not match.

- Mission Type can be pre-selected from the list. The list is configurable by the system's Housekeeper. If selecting "Other" a free- text field will open that allows inserting a Mission Type with a maximum of 20 characters.



Selecting a Mission Type from the list

- Name of Template allows selection of pre-defined mission templates. The text field used here is a filtering field. Characters inserted into this field will filter all templates according to the inserted values, e.g. inserting an “a” will display a list with all Mission Templates starting with an “a”. Keeping the field empty and selecting the “Search” button will open a list with all templates. After selecting a template the applicable fields will be filled out accordingly. They can be adapted as required afterwards.



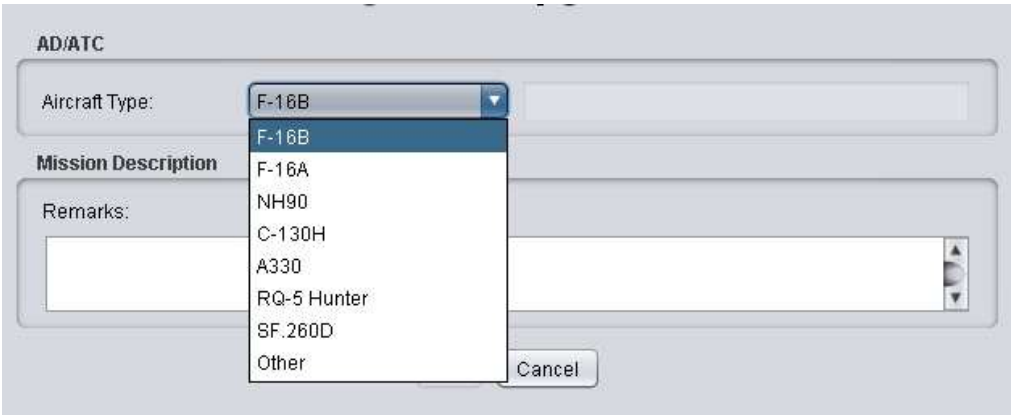
Available Mission Templates

- Aerodrome Information and Other Service Providers can be selected from the drop down menus as required. These entries are configurable by the system’s Housekeeper. By selecting “Other” a free text field becomes available allowing entries up to 20 characters.

- The buttons Air-to-Air refueling and AD/ATC allow switching between different types of fields allowing entry of Air Defense / Air Traffic Control Type of missions and Air to Air Refueling Missions.

The fields available for Air-to-Air-Refueling Missions

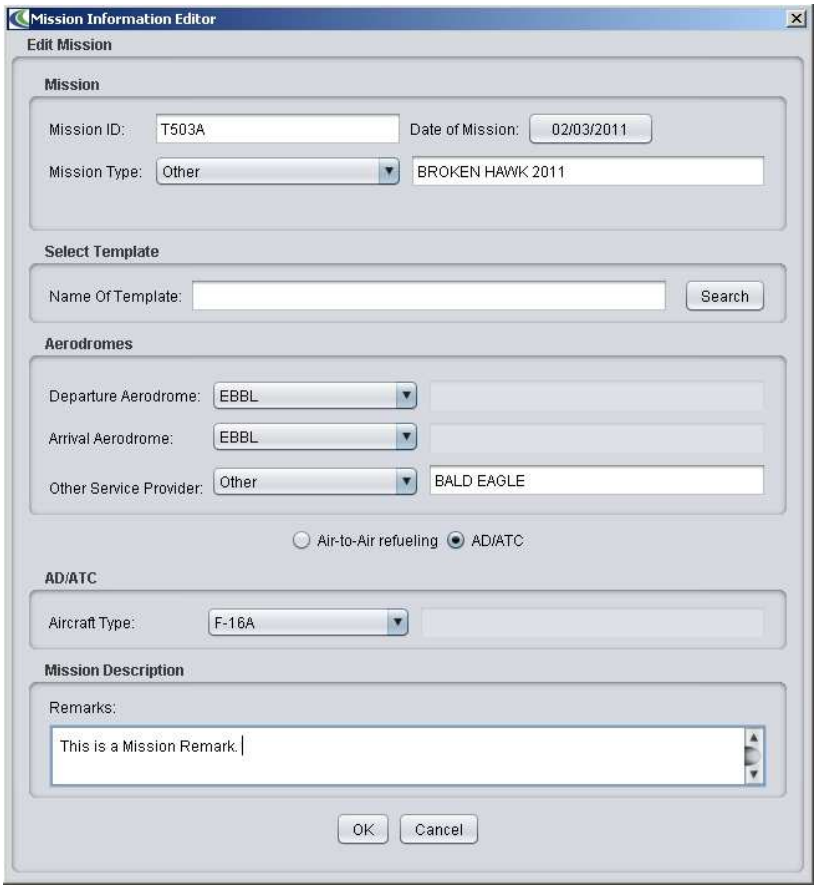
- Aircraft Type can be selected when switching to AD/ATC Missions.



For AD/ATC Missions only the aircraft type can be selected from the list.

- The Remarks field allows free text Mission Description.
- Selecting the OK Button will close the Mission Information Editor and save the entries with the reservation.

Note: The mission data will be visible to all connected clients within the local and all connected foreign clusters once the reservation is submitted. Users should not enter confidential information outside the agreed scope.



The Mission Information Editor ready to be submitted

Mission Management Tool

LARA provides a dedicated tool for Mission Template creation and management. Open the Tools Menu from the Menu bar and select Mission Management. The Template Editor will open and display all available mission templates.

The Template Editor

Select the Add button to create a new template from scratch. The Mission Template Editor will open and allow specifying various fields. The fields of the Mission Editor Template are similar to the Mission Information Editor as they are directly correlated to each other. For more details on the individual fields refer to the section on entering Mission Information.

The main difference between the windows is that the template editor does not show a Mission ID; instead a Template Name is mandatory.

To edit a Mission Template, select the appropriate mission template and select the Edit button. The Mission Template Editor will open with the fields already filled with the information applicable to the selected mission template.

Adapt all settings as required. Select OK to save the changes to the template, select Cancel to close the Mission template without saving any changes.

Mission Template Editor

To delete a mission template, select the name in the Template Editor and press the Delete button. The selected template will be deleted accordingly. This will have no adverse effect on any reservations that have previously used this template for the Mission Information Tab as the Mission Templates are

only used to fill the fields according to the template. The template itself is not connected to any reservation.

Note: The Mission Templates are not protected in LARA. Any user can create new, edit or delete Mission Templates without restrictions. It is beneficial to define within a cluster certain procedures on the management of templates in order to avoid confusion.

4.5.5 Additional Information Tab

The Additional Information Tab provides the users with a free text field that allows users to enter or copy paste additional information and save it with the reservation for other users to see. The field does not feature a word wrap functionality – the text will only start in a new row upon a manual "carriage return".

Additional Info Tab

The Comments field can be used by other users along the approval chain to add, change or delete information as appropriate. The Creation Time refers to the initial usage of this field and is not updated when other users change the contents of the comment field.

4.5.6 History Tab

The History Tab provides the user with an overview over the history of the reservation starting from Creation to either Completion, Cancellation or Expiration. The different steps (Change Types) are listed with the date/time when they took effect and the originator of the change.

History Tab showing the changes of a reservation

Selecting a line of the Reservation History will display additional details in the window below related to the change. The following change types are known to LARA and will provide the following additional information:

- *CREATED* – The Reservation has been submitted to the system.
- *APPROVED* – The Reservation has been approved by a user on the approval chain. The history does not refer to the actual approval states defined in the approval chain, it indicates approval by a role/approval group in general.
- *EDITED* – The Reservation has been edited. The type of edit is described in the information window.
- *PROPOSED* – A user has issued a proposal. The details of the proposal are described in the Information Window.

Note: LARA differentiates between Edits and Proposals to Reservations depending on who is performing the change and what data items it refers to. For more information see Chapter4.8 Managing Reservations

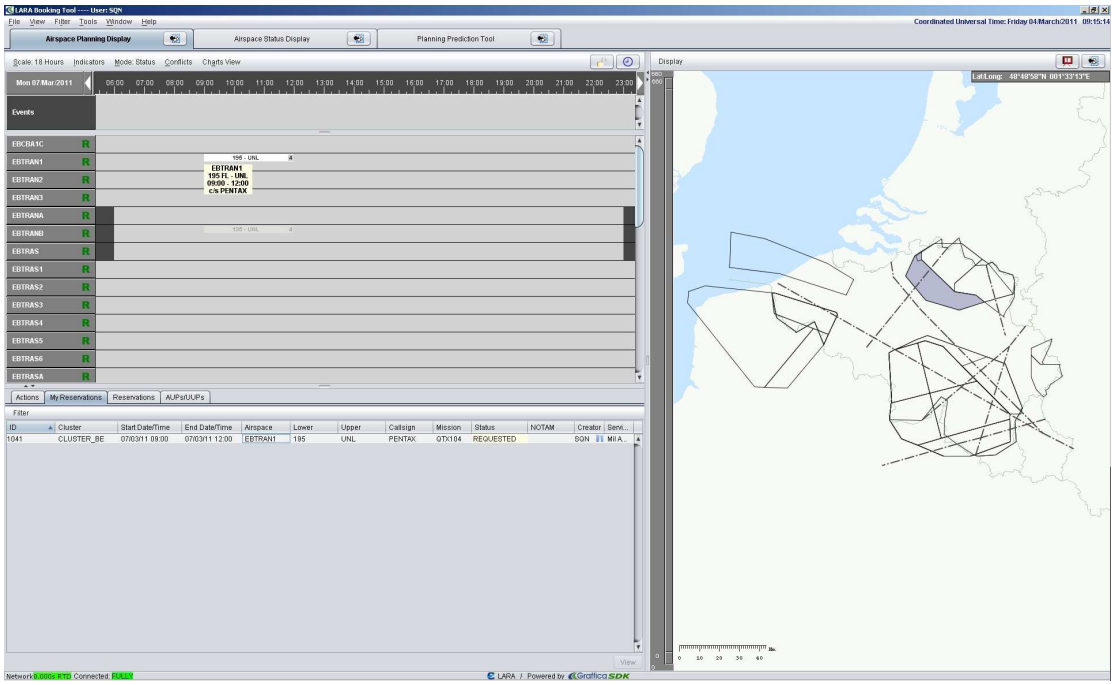
- *PROPOSAL ACCEPTED* – The user that has created this reservation has accepted the proposal.
- *PROPOSAL REJECTED* – The user that has created this reservation has rejected the proposal.
- *EDITED* by the originator after a Proposal has been issued – the user has not accepted a proposal, but made a counter proposal by rejecting and then editing the figures.
- *CANCELLED* – the reservation has been cancelled. The cancellation reason is available in the information window.
- *EXPIRED* – the Reservation has passed without being approved.

Note: The History Tab does not indicate the changes in regard to the airspace status, i.e. the status pending, active and de-active will not be listed here.

4.6 Display of Reservations

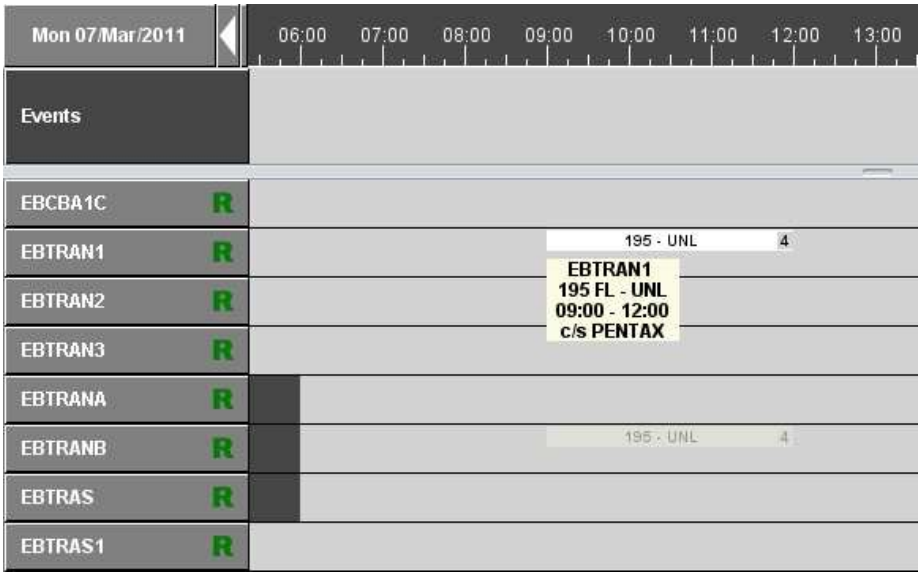
Once the reservation has been submitted to the system, the server will process it and provide access to all connected LARA working positions. The information on this reservation is now accessible from various places in various ways.

On the Planning Chart a reservation bar is visually depicted, corresponding to the time and airspace selected for the airspace reservation. The color of the bar is in line with the current status of the reservation request. The reservation will additionally be visible in the Planning Information Tab and the related airspace will be highlighted on the AVD when hovering over the reservation.



A single reservation on the Airspace Planning chart

The position of the reservation bar itself indicates the requested airspace and the start- and end-time of the reservation. Within the reservation bar the lower and upper limit are displayed and on the right edge the priority is displayed (4 in this example) If a user wants to quickly obtain an summary on the reservation a pop-up window is available when hovering with the mouse cursor over the reservation bar.



Pop-up Window giving quick access to additional information

The summary will consist of the airspace, the lower and upper limit, the start and end time and if available the callsign of the flight(s) involved.

Additional information can be obtained from the Planning Information Display. The reservation will show up on the “My Reservations Tab” of the requestor and the Reservations Tab of all connected positions.

Detailed information on the reservation is found on the Planning Information Display

Note: LARA offers a number of filtering options for the PID, which are explained later in this User Manual. If certain filters are set the reservation might at first not be visible on the PID.

4.7 The Approval Chain

Each reservation submitted to the system will be managed according to an approval chain. Each cluster has its own approval chain, which will follow national procedures and is configured and maintained by the LARA Administrator.

The most simple approval chain will be a purely hierarchical one. Each user has one or more superiors, which need to approve the reservation. In the military context this is normally starting at the Squadron as requestor, whose request is approved by the Wing Operations Centre and additional higher military authorities until it reaches the Airspace Management Cell, which has final say on the airspace allocation during the planning phase.

This sequence might be typical for the planning phases, but other circumstances require adaptations to this sequence and LARA is capable of identifying these and adapting the approval chain accordingly.

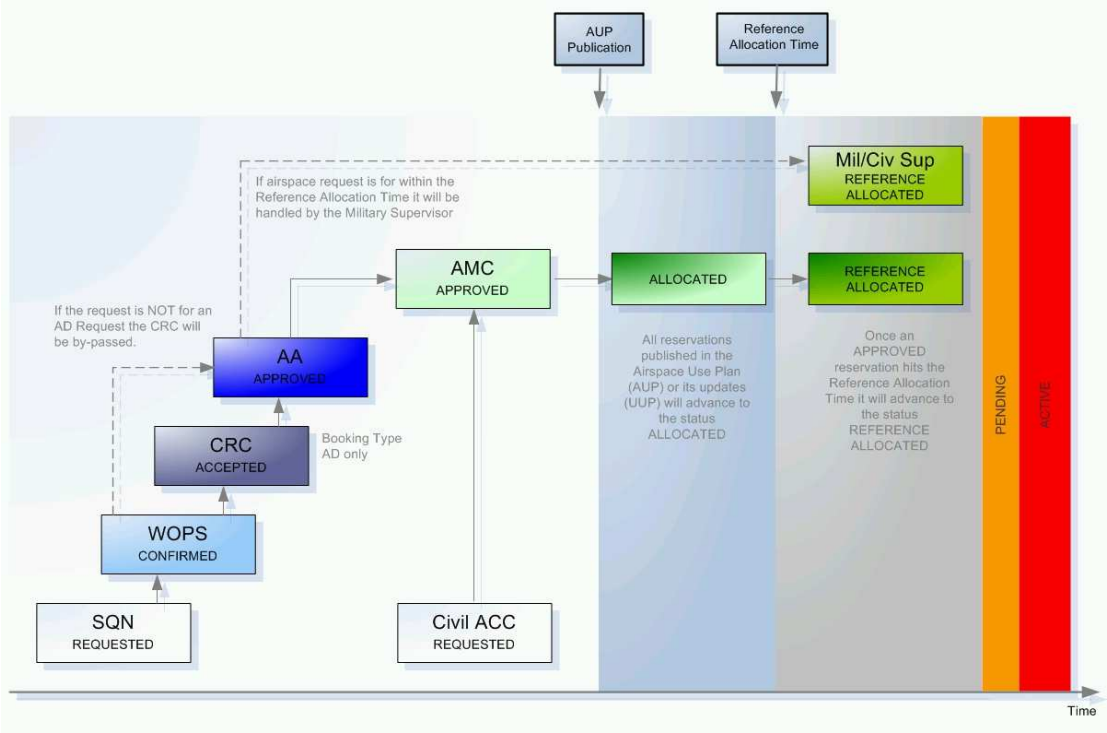
This manual will use a classical approval chain that is depicted below in this section. Military reservations follow the military chain until reaching the AMC. In case the Booking Type of a reservation is AD (Air Defense) the CRC will be included in the approval chain. For all other Booking Types, the CRC is not considered.

Civil requests for airspace by Flow Management Positions and alike from a civil ACC are routed directly to the AMC. After the required coordination, at a predefined moment in time the AMC will publish all Approved Reservations and the resulting available Conditional Routes in an Airspace Use Plan (AUP), which will upgrade the status of these published reservations to *ALLOCATED*.

Once they reach the *Reference Allocation Time* the status changes to *REFERENCE ALLOCATED*. Any change to a reservation or short notice introduction of a new reservation within the reference allocation time is managed not by the AMC, but by the responsible supervisor.

This is another switch that LARA manages automatically: after reaching the Reference Allocation Time, reservations will be directed to the Supervisors, not the *AMC*.

There are a number of additional rules definable for the approval chain. For more details contact the local LARA System Administrator.


AUP Publication
Reference Allocation Time
Mil/Civ Sup REFERENCE ALLOCATED
If airspace request is for within the Reference Allocation Time it will be handled by the Military Supervisor
AMC APPROVED
ALLOCATED
REFERENCE ALLOCATED
If the request is NOT for an AD Request the CRC will be by-passed.
AA APPROVED
All reservations published in the Airspace Use Plan (AUP) or its updates (UUP) will advance to the status ALLOCATED
Once an APPROVED reservation hits the Reference Allocation Time it will advance to the status REFERENCE ALLOCATED
PENDING
ACTIVE
CRC ACCEPTED
Booking Type AD only
WOPS CONFIRMED
SQN REQUESTED
Civil ACC REQUESTED
Time

The approval chain in LARA

The requestor of a reservation and who has already approved it, will determine the status of a reservation. These Stati are configured for this approval chain:

- *REQUESTED*: The airspace user (i.e., a military or civil airspace user, a civil ATC-Centre etc) submits a reservation request.
- *CONFIRMED:* This is a typically military status whereby a hierarchical level has to agree with the request.
- *ACCEPTED:* This is a typically military status whereby a hierarchical level has to agree with the request.
- *APPROVED;* A booking request that was selected by the AMC (after negotiation and taking into consideration the priorities and any other national agreements) will change into “Approved”-status.
- *ALLOCATED:* After the publication of AUPs/UUPs reservations will obtain the status Allocated.
- *REFERENCE ALLOCATED:* When the consolidation period is entered (based on the reference allocation time), no additional requests are to be introduced, and hence the “Allocated” (*published*) request becomes “Reference Allocated”. All involved actors will now assume this reservation to go ahead as planned.

4.8 Managing Reservations

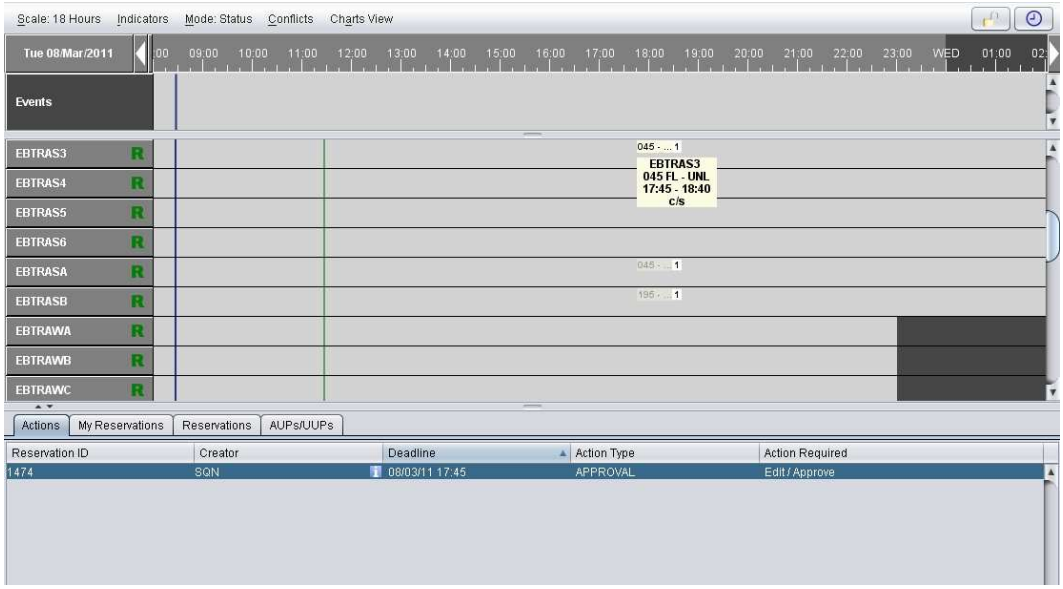
Once a reservation is introduced to the system the next user/role in chain will receive a notification: the reservation will be displayed in the *Action Tab* of the Planning Information Display on the Airspace Planning Display.

As this window opens by default when starting LARA, every user will immediately see the actions to perform. As the user could already be working on another tab or window, LARA displays an attention-getter in the below right corner of the display resembling a blue flag and a number next to it indicating the number of outstanding actions.

The blue flag indicating that a user has one action to perform

The user has the following options:

- *ignore* the action and continue with other activities
- *navigate manually* to the reservation and perform the action
- *click on the blue flag*, which will move the view automatically to the Action Tab displaying the outstanding actions



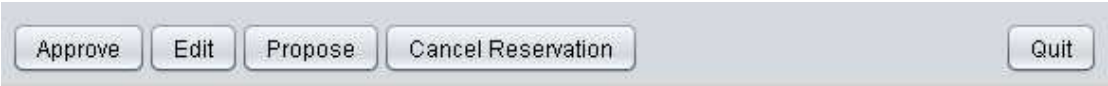
One action requires attention in the action tab

There are several ways to open a reservation in order to access all details and perform actions on it. If the user double-clicks the reservation bar, the Airspace Reservation Editor will open and display the details of the reservation.

Another option is to select the reservation from a tab of the Planning Information Display and select the *View Button* available at the bottom of the display.

The Airspace Reservation Editor will open and all fields will be displayed grayed out and not accessible. The information however can be read from the different tabs.

Depending on the origin of the reservation and the privileges assigned to the user, the ARE will display a number of buttons at the bottom allowing the user to work with this reservation.



Possible options at the bottom of the Airspace Reservation Editor

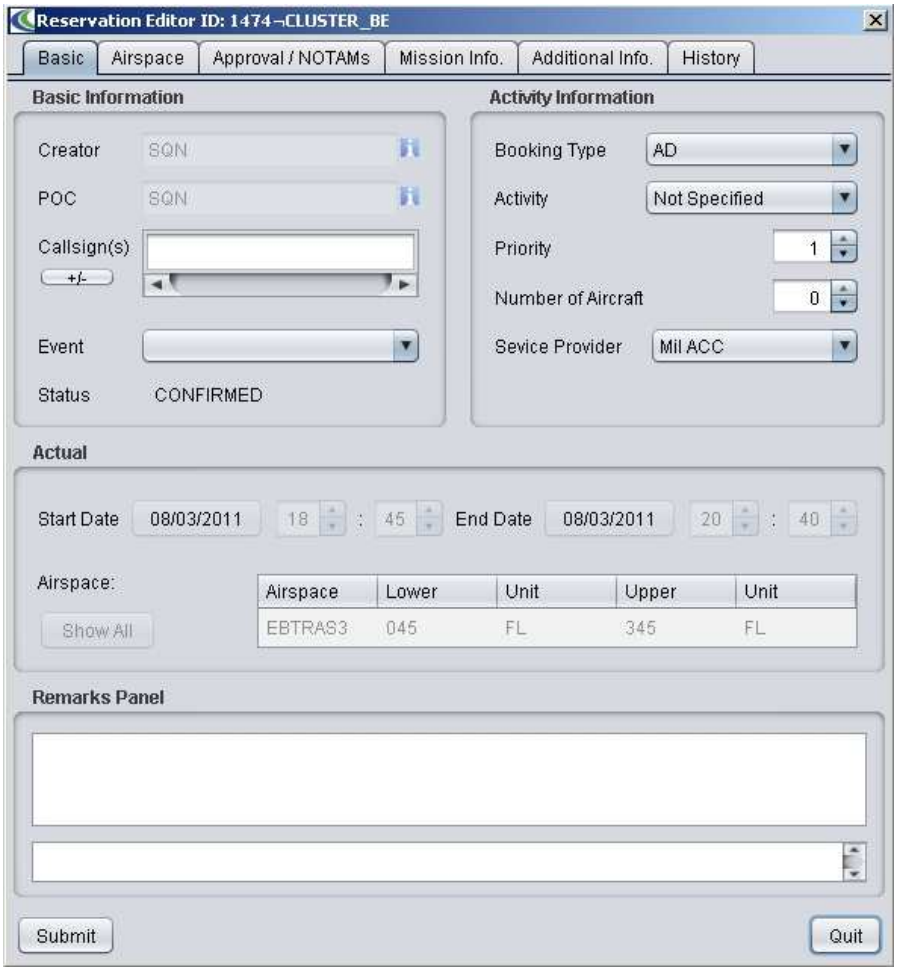
The available buttons are the following:

- *APPROVE* - pressing this will approve the reservation “as is” and send it to the next higher user/role in the approval chain.
- *EDIT* - the edit button has several functions - depending on who uses it. It basically allows the originator to change the reservation freely. Other users may only change a certain type of fields:
    - The creator of the reservation will have access to all fields of the reservation once pressed, up and until the reservation has reached the status APPROVED. This will allow changing all fields. If the originator changes essential fields after superior units have already approved the reservation, the status will revert to its original status (the status it received when introduced) and will have to be approved by superior units again.
    - All superior users on the approval chain will have access to all “inessential fields” of the reservation once EDIT is pressed.

Note: LARA differentiates between ESSENTIAL and INESSENTIAL fields in a reservation.

ESSENTIAL fields alter the core of a reservation, which have an effect on the airspace and its allocation, i.e. airspaces, times and levels. Changing these fields will require reservations to be approved again to ensure all are aware of this essential change.

INESSENTIAL fields are all other available fields. They merely supplement the reservation with additional information, e.g. mission information, callsign, remarks etc.



After pressing EDIT the user can only access and change inessential fields.
The essential fields are grayed out.

- *Propose* – the Propose button will only be available to users superior to the original requestor of the reservation. Its purpose is to propose changes to the essential fields of a reservation to the originator.

  Once the button is pressed the Airspace Reservation Editor will expand by an additional section allowing to make the proposal.

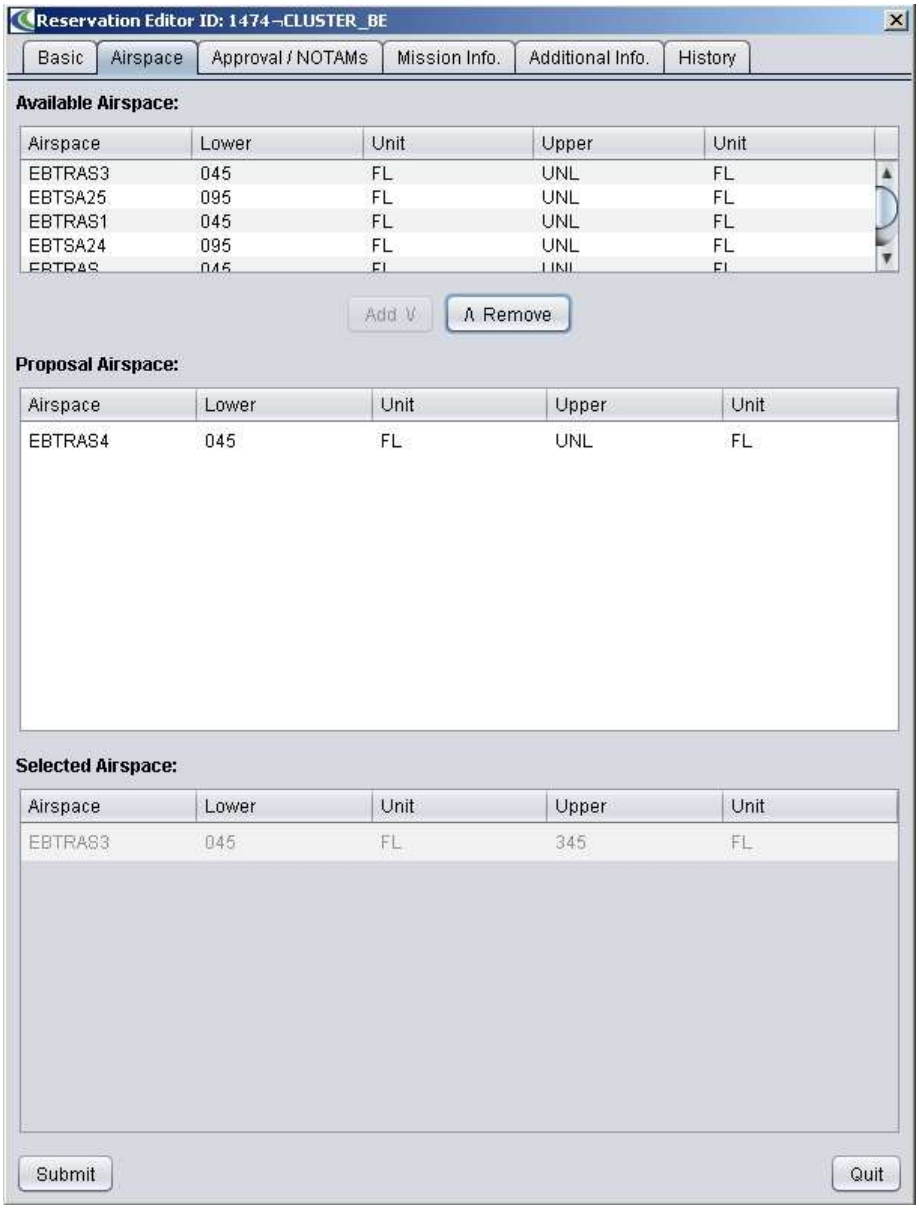
The *Actual Field* will remain and display the original request, while the new *Proposed* section will allow the user to propose changes to the start and end times, the airspace and its lower and upper levels of the reservation.

After pressing PROPOSE the ARE is extended by a Proposed Section

In order to propose a different airspace, the user needs to navigate to the Airspace Tab of the Reservation Editor and select the new airspace.

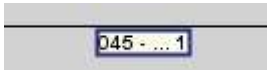
Note: Due to the system limitations, the proposal of a new airspace is only possible if the proposed airspace is adjacent and/or overlapping to the current one.

In order to change the airspace, select the appropriate airspace(s) from the *Available Airspace Section* and press the *Add Button*. Afterwards select the original airspace from the *Proposed Airspace Section* and press the *Remove Button*. The sequence is important as LARA does not allow the *Proposal Airspace Section* to be empty.



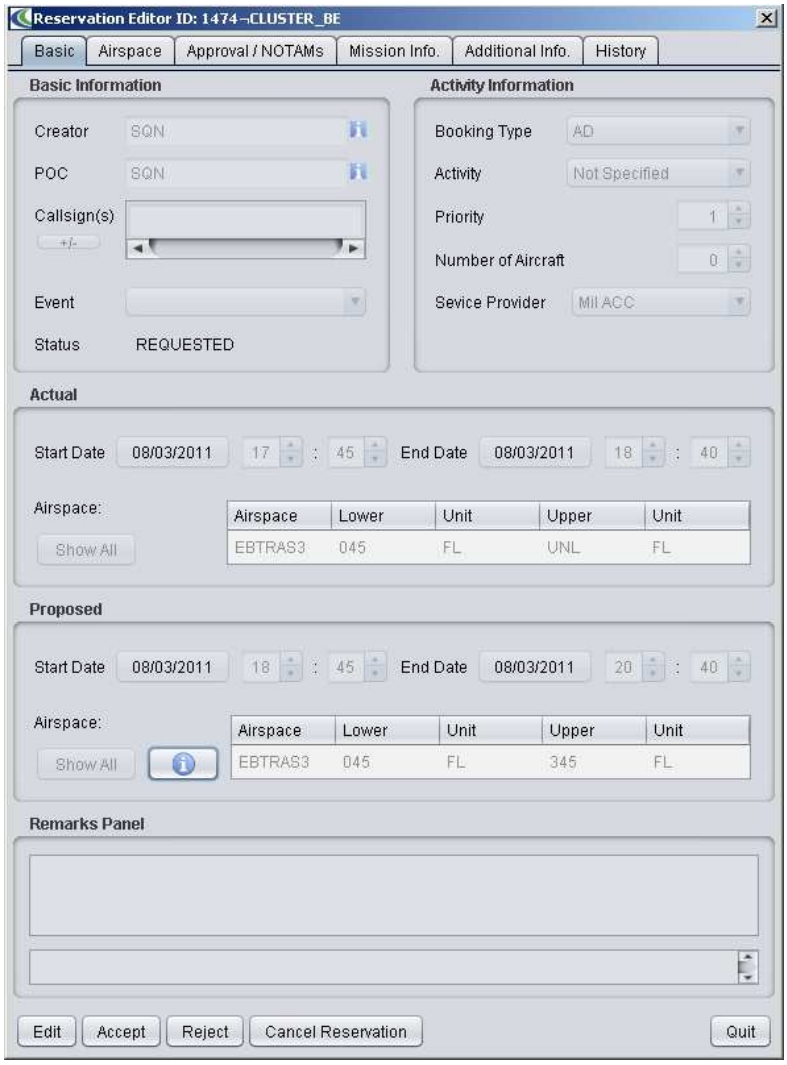
From the Airspace Tab, a new airspace can be proposed

The Additional Info Tab allows adding additional information to a proposal. Once the *Submit Button* is pressed the Proposal will appear in the Actions Tab of the originator of the reservation for further processing. On the Planning Chart the respective reservation will be marked by a blue border around the reservation bar to indicate the proposal.

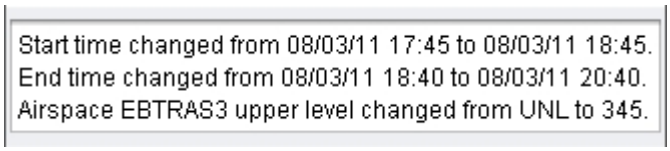


A proposal is marked by a blue border around a reservation bar

Once the Originator opens the proposal from the Action Tab, the Airspace Reservation Tab will open and provide details on the proposal. In order to quickly identify the proposed changes, clicking on the blue *Info-Button* will reveal the details in text form.



The requestor can compare the original request with the proposal


Start time changed from 08/03/11 17:45 to 08/03/11 18:45.
End time changed from 08/03/11 18:40 to 08/03/11 20:40.
Airspace EBTRAS3 upper level changed from UNL to 345.

In order to obtain details about the proposal press the blue info button

The user has several options to react on a proposal indicated by the buttons at the bottom of the Airspace Reservation Editor.

- *Edit* – button will allow changing inessential fields as described earlier.

- *Accept* – button will accept the proposal "as is". The reservation will change from the proposed status to the original requested status and will be sent through the approval chain again to ensure awareness of the changes to all involved. The reservation bar on the Planning Chart will be moved to the new location in line with the changes and the blue border will be removed.

- *Reject* – button will reject the proposal and leaves the user two options;

    - make a counter proposal using the now available fields in the *Actual Section*, which will change the reservation to the original status and send it with this counter proposal through the approval chain; or

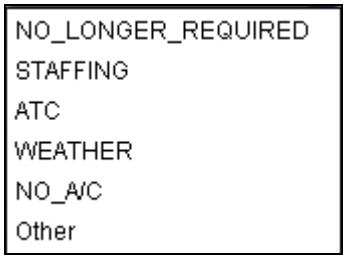
    - leave the reservation as originally requested. The reservation will remain in the current status.

- *Cancel Reservation* – button will cancel the reservation and remove it from the Planning Chart. It will still be accessible from the Planning Information Display for reference.

  LARA requires every cancellation to be justified by an appropriate reason. The list of reasons is configurable by the LARA Housekeeper. If no pre-configured reason applies, selecting *Other* from the list will allow inserting free text.

Note: The option to cancel a reservation is not only available to the requestor, but all users involved in the approval chain.

The window allowing to cancel a reservation

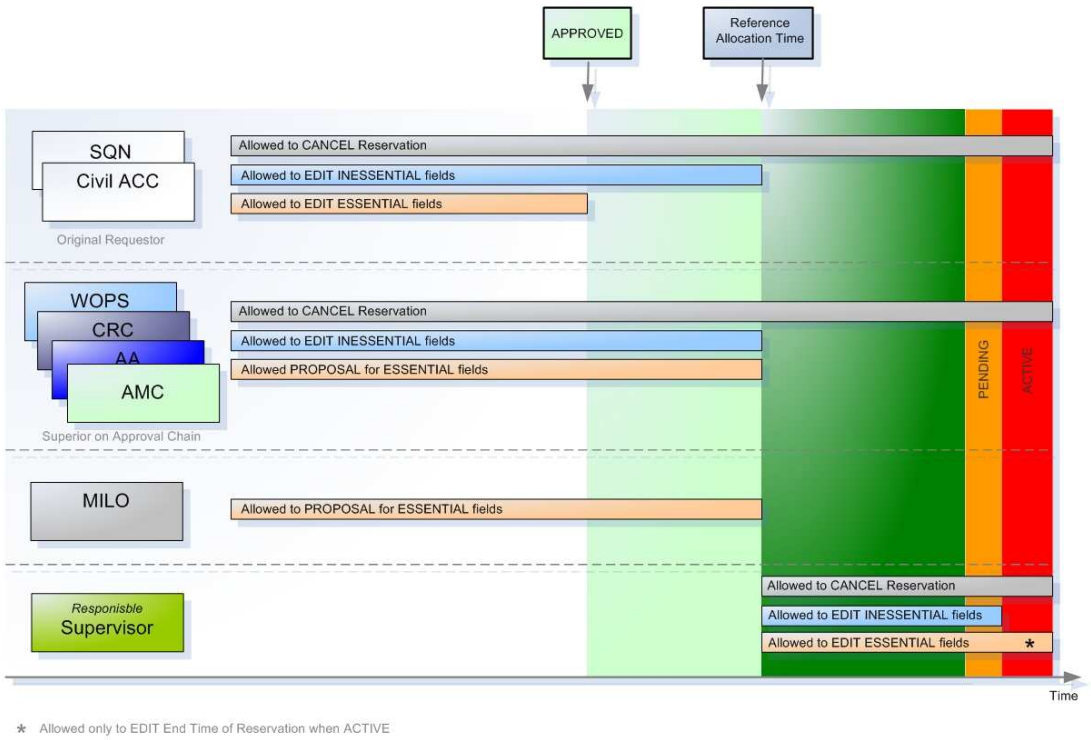


The dropdown menu of preconfigured cancellation reasons

- *Quit* – button closes the Airspace Reservation Editor without any action performed.

The following figure summarizes the different privileges of users on reservations managed in LARA. Users not involved with the booking process and the approval chain of a reservation will only have the option view the contents of a reservation.

One exception being the *Military Liaison Officer at CFMU (MILO)*. This role can make proposals to all reservations prior reaching the *Reference Allocation Status* with the aim to optimize the airspace utilization. More on the MILO functionality in LARA at a later stage.

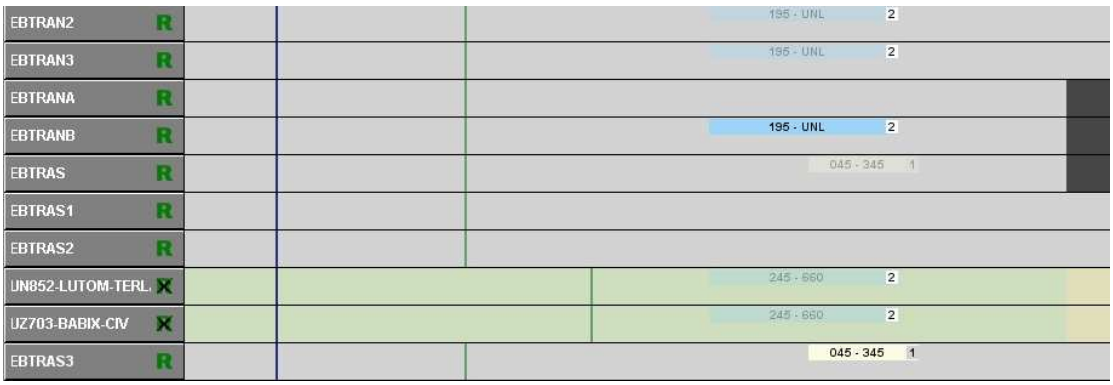


The privileges of the different roles

4.9 Shadow Bookings

A reservation of an airspace volume can have an impact on other airspace volumes, which in turn can lead to conflicts between reservations, which might not be obvious at first.

In order to indicate that an airspace volume is affected by another airspace reservation, LARA displays *Shadow Bookings* on the affected airspaces on the *Planning Chart*. These are reservation bars of lower opacity in the same colour and with the same information as the original booking.



The Shadow Bookings as displayed on the Planning Chart

LARA displays *Shadow Bookings* if airspaces are configured as overlapping in the database. The LARA Housekeeper has tools at his disposal to adapt the overlapping airspace settings in the database. As can be seen in the above picture, the shadow bookings are displayed on overlapping areas as well as on overlapping CDRs.

Shadow Bookings show similar functionality like the original reservation bars:

- Hovering over them with the mouse will show a pop-up menu with additional information and highlight the airspace on the Airspace Visualization Display.
- Double-clicking them will open the Airspace Reservation Editor showing the details of the original reservation.

Note: The Shadow Bookings will not show any outlines on the reservation bar to indicate proposals (blue) or conflicts (red). These will only be shown on the original reservation bar. This is on purpose to avoid cluttering the screen with additional indications.

4.10 Conflicts

In case two reservations overlap in time and (air)space (volume) they will be *in conflict*. This is true for identical airspace volumes and overlapping airspaces alike. The logic is similar to the previously explained *shadow booking logic* – LARA considers overlapping airspaces in its conflict detection.

If a reservation will produce a conflict, the system will warn the user when attempting to submit this reservation: a window will appear warning the user about the conflict. LARA will give the option to disregard the warning and submit the reservation by pressing the *Yes Button*. It is now up to superior roles to manage the conflict.

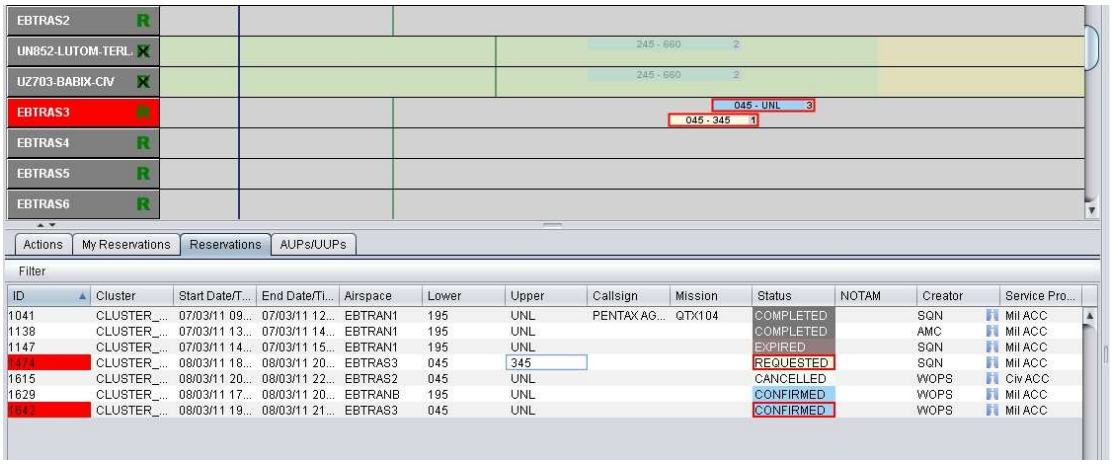
The user can as well select the *No Button*, which will return the Airspace Reservation Editor and allows adapting the details of the reservation to avoid the conflict.

LARA Confirmation
There is a problem with Reservation 1642¬CLUSTER_BE.
It conflicts with Reservation 1474¬CLUSTER_BE.
Do you wish to continue with this Reservation ?
Yes
No

The window warning the user about a conflict

Conflicts are displayed in red at various places on the HMI to ensure they do not go unnoticed.

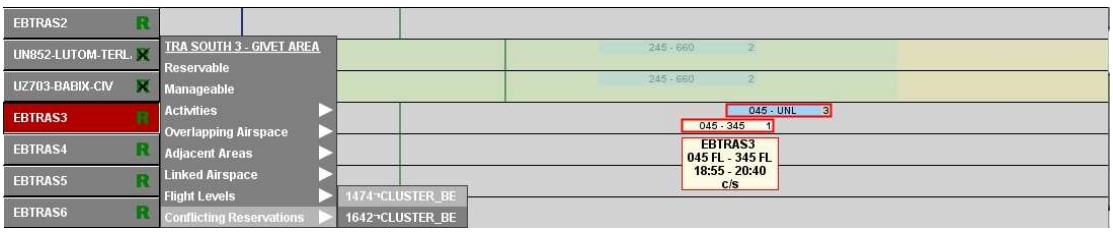
- The reservation bars of all reservations involved in the conflict are surrounded by a red border – same is true for the pop-ups when hovering over the reservation bars. As explained above this is not the case for the shadow bookings


EBTRAS2
UN852-LUTOM-TERL
UZ703-BABIX-CIV
EBTRAS3
EBTRAS4
EBTRAS5
EBTRAS6
245 - 660
045 - UNL
045 - 345
Actions
My Reservations
Reservations
AUPs/UUPs
Filter
ID | Cluster | Start Date/T... | End Date/Ti... | Airspace | Lower | Upper | Callsign | Mission | Status | NOTAM | Creator | Service Pro...
1041 | CLUSTER_... | 07/03/11 09... | 07/03/11 12... | EBTRAN1 | 195 | UNL | PENTAX AG... | QTX104 | COMPLETED | | SQN | Mil ACC
1138 | CLUSTER_... | 07/03/11 13... | 07/03/11 14... | EBTRAN1 | 195 | UNL | | | COMPLETED | | AMC | Mil ACC
1147 | CLUSTER_... | 07/03/11 14... | 07/03/11 15... | EBTRAN1 | 195 | UNL | | | EXPIRED | | SQN | Mil ACC
1474 | CLUSTER_... | 08/03/11 18... | 08/03/11 20... | EBTRAS3 | 045 | 345 | | | REQUESTED | | SQN | Mil ACC
1615 | CLUSTER_... | 08/03/11 20... | 08/03/11 22... | EBTRAS2 | 045 | UNL | | | CANCELLED | | WOPS | Civ ACC
1629 | CLUSTER_... | 08/03/11 17... | 08/03/11 20... | EBTRANB | 195 | UNL | | | CONFIRMED | | WOPS | Mil ACC
1642 | CLUSTER_... | 08/03/11 19... | 08/03/11 21... | EBTRAS3 | 045 | UNL | | | CONFIRMED | | WOPS | Mil ACC

Conflict Display on the Airspace Planning Display and Planning Information Display

- The *Area of Interest Tab* on the left side of the *Airspace Planning Chart* is coloured red for all airspaces involved in the conflict. Clicking with the right mouse button on the tabs will open the *Airspace Information Displays* with an additional entry at the bottom named *Conflicting Reservations*. Selecting this entry will show the *Reservation-IDs* of the involved reservations. Hovering over these entries will display the respective reservation on the Planning Chart, as well as triggering the pop-up to appear.

  Clicking on an entry will open the Airspace Reservation Editor of the selected reservation. This functionality allows identifying and accessing the correct reservation very quickly – even on a display with a high number of airspaces and reservations scattered over an extended time period.

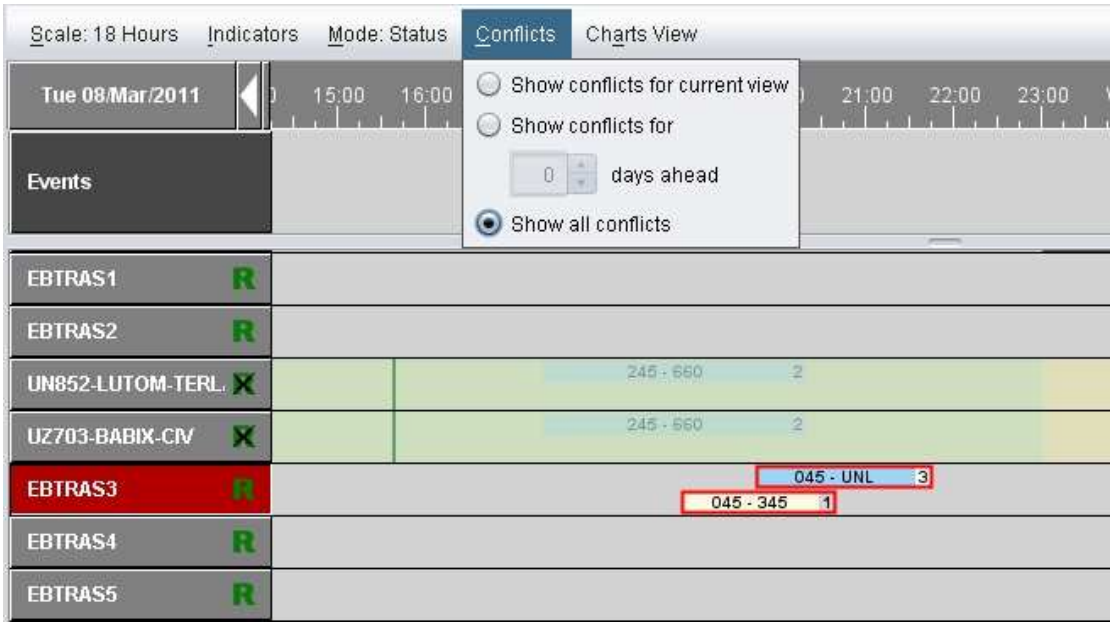


The conflicting reservations can be quickly accessed by the Areas of Interest Tabs

- The Reservation ID of the conflicting reservations will be displayed with a red background on the Planning Information Display. Additionally the status will be surrounded by a red border – similar to the reservation bars.

Note: The color red is only used as a warning color in LARA. It either indicates a conflict or an active airspace – any other usage of red is avoided.

The conflict display in LARA is aimed at ensuring that conflicts are detected in time and cannot go unnoticed. This could potentially lead to an overload of conflict warnings on the screen. In order to focus the LARA display on those conflicts that are important at a particular time, a series of filters have been implemented. These can be accessed by the *Conflicts Menu* above the *Planning Chart.*



The filtering options for conflicts can be found above the Planning Chart

The basic rule for conflict display in LARA is that conflicts will always – regardless of filter settings - be displayed around the reservation bar itself and on the entries in the Planning Information Display.

The *conflict display* on the *Areas of Interest Tabs* however can be filtered with the following options:

- *Show conflicts for current view* will take into consideration only the time frame that is chosen and displayed for the Planning Chart. If this is selected and the time frame displayed does not host any conflicts, no conflict indication will be displayed.
- *Show conflicts for x days ahead*. The user can select a time frame in days for when conflicts will be displayed. If for example a user is not interested in any conflicts beyond tomorrow, a selection of "1" will only display today's and tomorrow's conflicts.
- *Show all conflicts* is the default option and will display all conflicts.

Note: Conflicts that have occurred in the past will not be displayed. More on conflicts will be discussed in the Airspace Status Section

4.11 Communication and Client Collaboration (Chat)

In order to allow efficient coordination between different users in the Airspace Management Process, LARA offers direct access to a number of communication facilities. Throughout the application users are presented with a symbol for *Information* containing additional contact information and possibilities. Clicking on the *blue "I"* will open the following options:

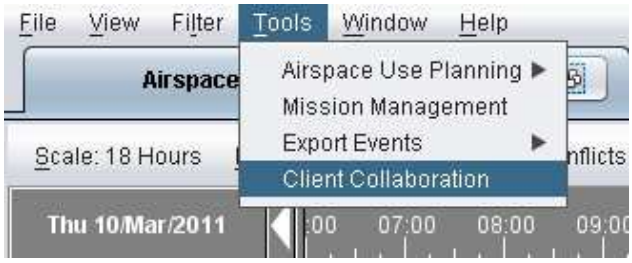
Different possibilities to communicate with other users

- *Start New Conversation* will open the Client Collaboration (Chat).
- *Email* will open an email window to the respective user if an email client is installed and configured on the client PC.
- *View Contact Info* will open a window with additional contact information. Name, email, telephone number, originating cluster and login status of this user is directly accessible.

The Contact Info. window with additional contact details of other users

Clicking on the symbols next to the displayed *Name* and *Email* will either start a chat communication with the selected user or open an email window. The information displayed here is maintained by the LARA Housekeeper.

The Client Collaboration (Chat) is a powerful communication tool within the LARA Application. It can be accessed via the *Tools Menu* on the *Menu Bar* or via the *Contact Info Window* by selecting *Start New Conversation.*

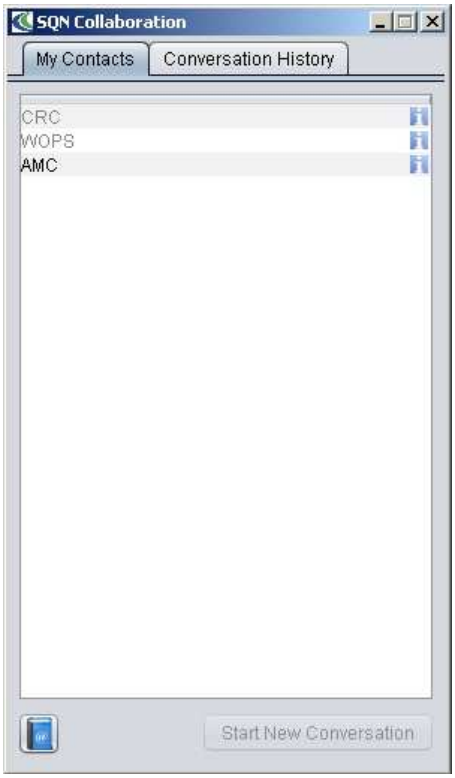


The Client Collaboration Facility can be accessed directly from the Tools Menu

Selecting the latter option will open directly a chat window with the selected user. Accessing the functionality via the *Tools Menu* will open the *Collaboration Window* displaying all available contacts. Online contacts will be written out in black font, while offline users appear grayed-out.

Note: This window is a quick and easy way to identify, which users are online and which are not.

When first opening this tool the list will most likely be empty. To add (or eventually remove) contacts to the list, click on the *phone book symbol* at the bottom of the window.

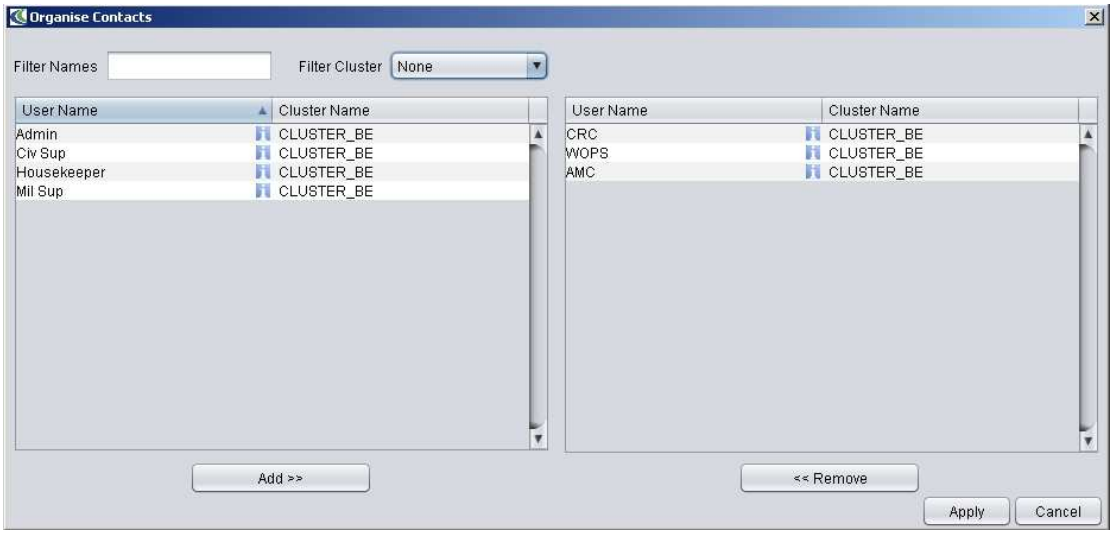


The Contacts List is configurable and displays the contacts and their online status

This will open the *Organize Contacts Window*, which works in a similar fashion as the *Preferences Window* for selecting which airspace to display on LARA explained earlier.

On the left side all users are shown, which are currently not displayed on the main Contact List, the right side displays the contacts selected for display.

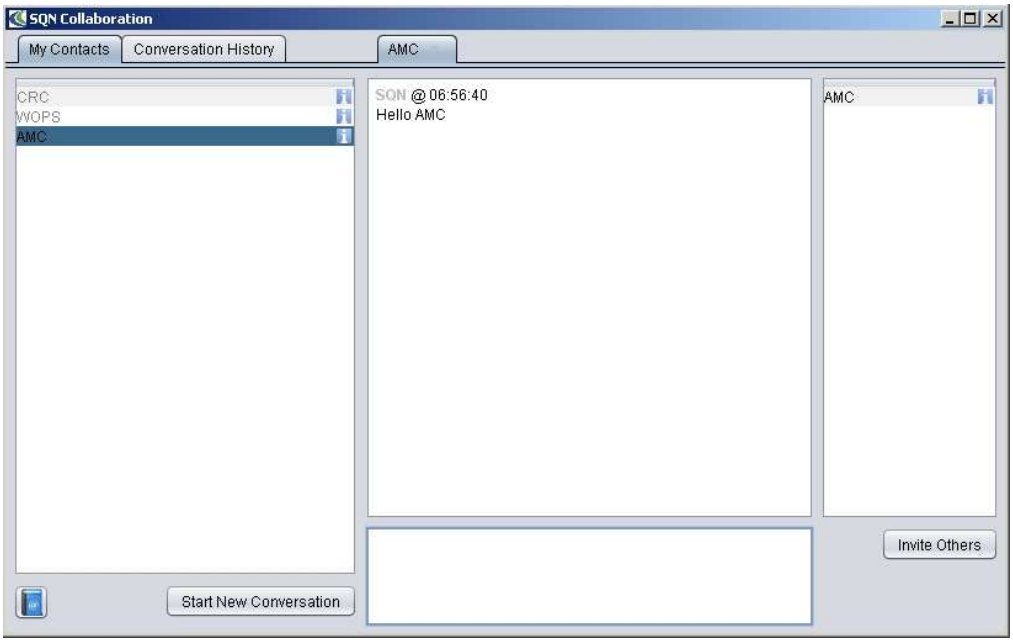
- In order to add users to the *Contact List*, select them on the left hand side (multiple selections are possible) and select the *Add >> Button*.
- To remove users from the Contact List, select these on the right side of the window and press the *Remove << Button.*
- The changes will take effect after pressing the *Apply Button*.
- The *Cancel Button* will close this window while discarding all changes.



Organizing the contacts for the Chat Facility is possible within this window

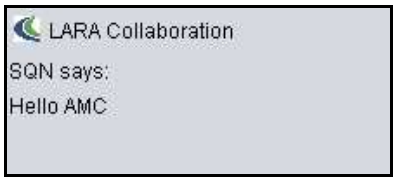
Via the *Contacts Window* the user can now select a contact and press the *Start New Conversation Button*. The window will expand to the right and give access to additional windows, eventually allowing to start the chat communication.

The cursor is automatically placed in the bottom window for text entry. The user enters the chat message here and sends it off via the *Enter Button* on the keyboard. The message will move to the upper window - tagged with the originator and a time stamp - indicating that it has been sent.



The main chat window

This message is now available on the AMC client position. The AMC user is informed about this message by a window sliding into the top right corner of the screen with the beginning of the chat message displayed.



This window will be sliding into view at the upper right corner of the screen

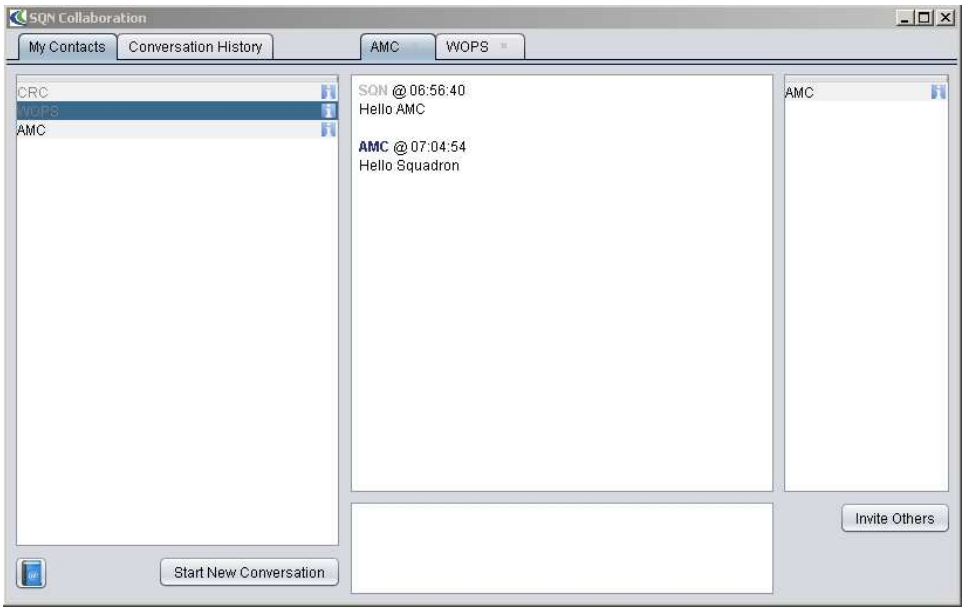
This message will appear even if the LARA Application is minimized or hidden beneath other applications and will be removed after a certain time. A blinking *blue bubble symbol* will be displayed in the lower right corner of the status bar. This bubble will remain there as long as the chat window is not accessed to read the message. The number next to the bubble indicates the number of unread chat messages.

The AMC can access the incoming chat directly by clicking on either of these notifications, i.e. clicking on the blue bubble or the sliding window. The chat window will open and the user can read and reply to the incoming message.

In case additional users are required for coordination, *LARA's Collaboration Facility* supports multiple users to join a chat session. *Selecting the Invite Others Button* will open a window with additional contacts, which can be selected for joining the discussion. Using the *Add* and *Remove Button* users can be selected for joining. Once users have joined the chat, they cannot be removed again. All participating users will be displayed on the right side of the main collaboration window.

Add contacts to the collaboration session

There is additionally the option to follow multiple chats in parallel. To start a chat in parallel, select the appropriate user from the *My Contacts List* and select *Start New conversation*. The different chat sessions are indicated by the different tabs at the top of the *Client Collaboration Window*. To select another chat session, click on the appropriate tab. To close a chat session press the *small x* on the tabs next to the name of the chat session.



Multiple chat sessions can be accessed via the tabs on top of the main chat widow

All chat communications are stored in the LARA Database. The *Collaboration Window* allows accessing the *Conversation History* via the appropriate tab. Either the user selects the message and clicks the *Show Conversation Button* or double clicks on the entry to open the chat conversation.

The Conversation history

4.12 Event Management

LARA supports management of *Events*. As with reservation request in LARA, these events are neither limited in time, duration or number and are managed in a similar fashion.

To create, edit or cancel events, a user has to have the appropriate privileges. For viewing Events no special privileges are required. The local system administrator can adapt these privileges if required.

Events are displayed above the Airspace Planning Chart in an enlarged row labeled *Events*. Via the *Charts View Menu* on top of the *Airspace Planning Display Menu Bar*, the user can select if the *Events Chart* shall be displayed or not.

The "Events Chart" and the options to select what to display on the APD

To create a new event, the user selects the proper date and time via the Planning Chart and clicks with the right mouse button on the appropriate area of the *Events Row*.

This will display a tentative *Event Bar* on the Planning Chart and open the *Event Editor*, which is used to specify the details of the event. The functionality is similar to the creation of reservation requests, i.e time and duration can be specified via the *Event Editor* or via *drag and drop* of the Event Bar on the Planning Chart itself.

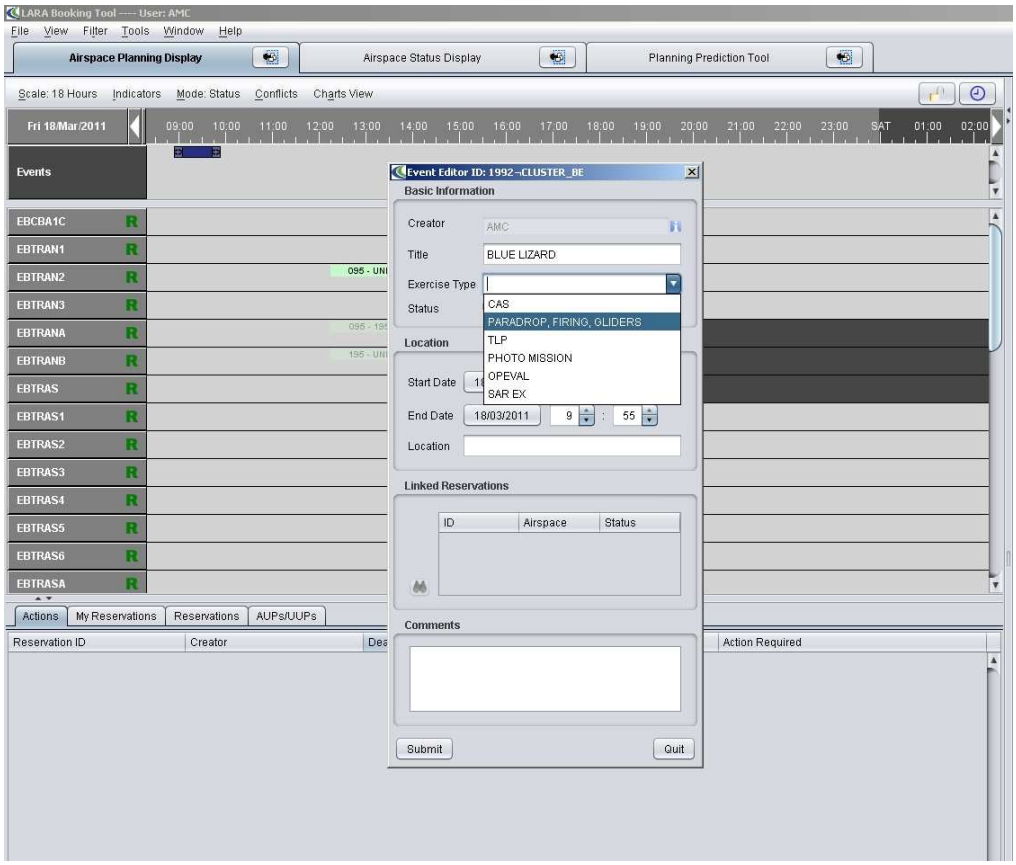
The only mandatory field of the Event Editor is the *Title* of the event, which will be displayed in the center of the Event Bar once the event has been submitted to the system.

The *Exercise Type* can be either typed-in manually or selected from the drop down list. The contents of the drop down list are adjustable by the LARA Housekeeper.

The Status of the Event is *UNDEFINED* as long as the event has not been submitted. *CONFIRMED* as soon as it is submitted and *CANCELLED* in case of a cancellation. Once the event hits the *Current Time Line* the status will change to *ACTIVE*.

The selection of the *Start-/End-/Date- and Time* fields follow the same logic as for reservation requests and can be selected/changed via the arrows, manual input or drag and drop on the Planning Display.

Note: Events follow certain system constraints: They cannot be created in the past, must last at least 60 minutes and have to be entered the latest 20 minutes prior their start time.

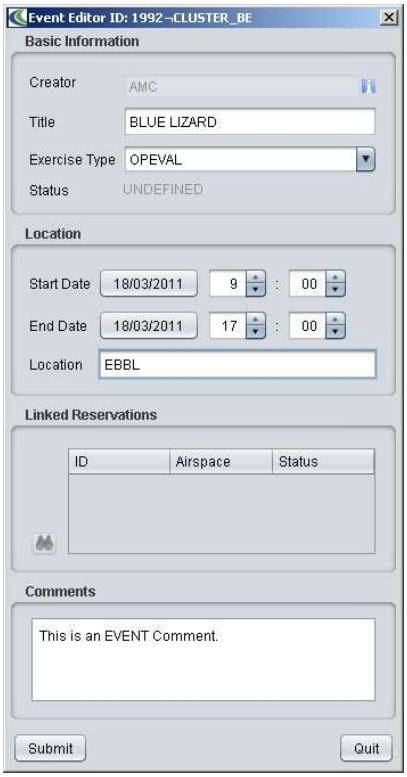


The Event Editor opening on the Airspace Planning Display

Via a free text fields the location of the event can be specified if desired.

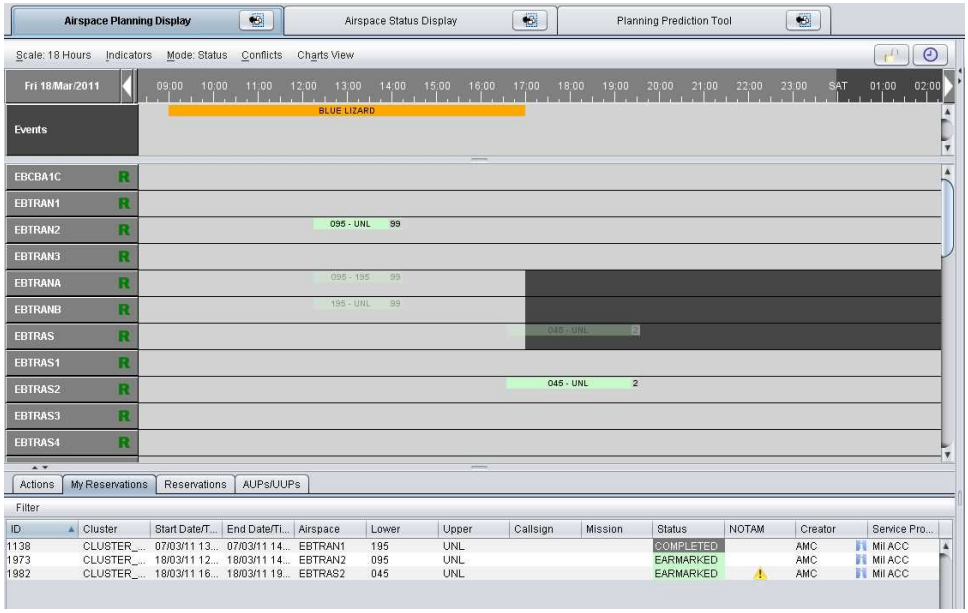
One of the key features of the Event Management Functionality in LARA is the possibility to link reservations to events. This is done via the *Airspace Reservation Editor*.

The *Comments Field* allows entering additional information via a free text field.



The Event Editor is ready to be submitted

Pressing the *Submit Button* will send the event to the LARA Server and make this data available and visible to all connected LARA Clients. The *Quit Button* will close the Event Editor without saving or submitting the entries.



The Event is displayed after submitting it to the system

Events are displayed in orange colour within the Events Row of the Airspace Planning Chart. Hovering with the mouse cursor over an event will open a

pop-up menu containing the name of the event, the location and start/end date/time.

The Pop-Up Window providing additional detail

Double-clicking the Event Bar will open the Event Editor to *view* the details of the Event and – if appropriate privileges are available – to *edit* or *cancel* the event.

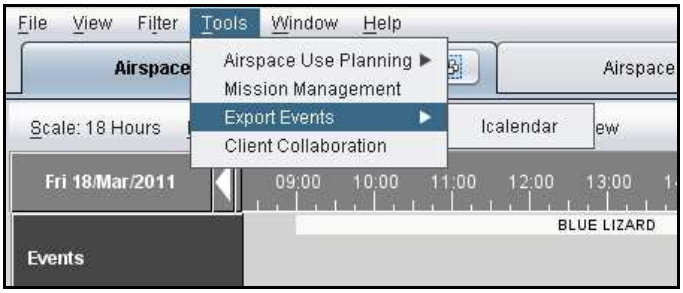
The Event Editor with linked reservations and Edit and Cancel Buttons

The above picture indicates that two reservations have been linked to this event. It is possible to open these reservations from the Event Editor by double-clicking the respective reservation or alternatively, selecting the reservation and clicking the *binocular symbol* thereafter.

To link a reservation to an event open the respective Airspace Reservation Editor and select from the available *Events* from the bottom drop-down menu in the *Basic Information Section*.

Linking an event to this reservation in the Airspace Reservation Editor

Events created and managed in LARA can be exported to the calendar standard format *iCal*, which is readable by other systems and third-party software. To access this functionality, select the *Export Events Option* from the *Tools Menu*. This functionality is available to all users.

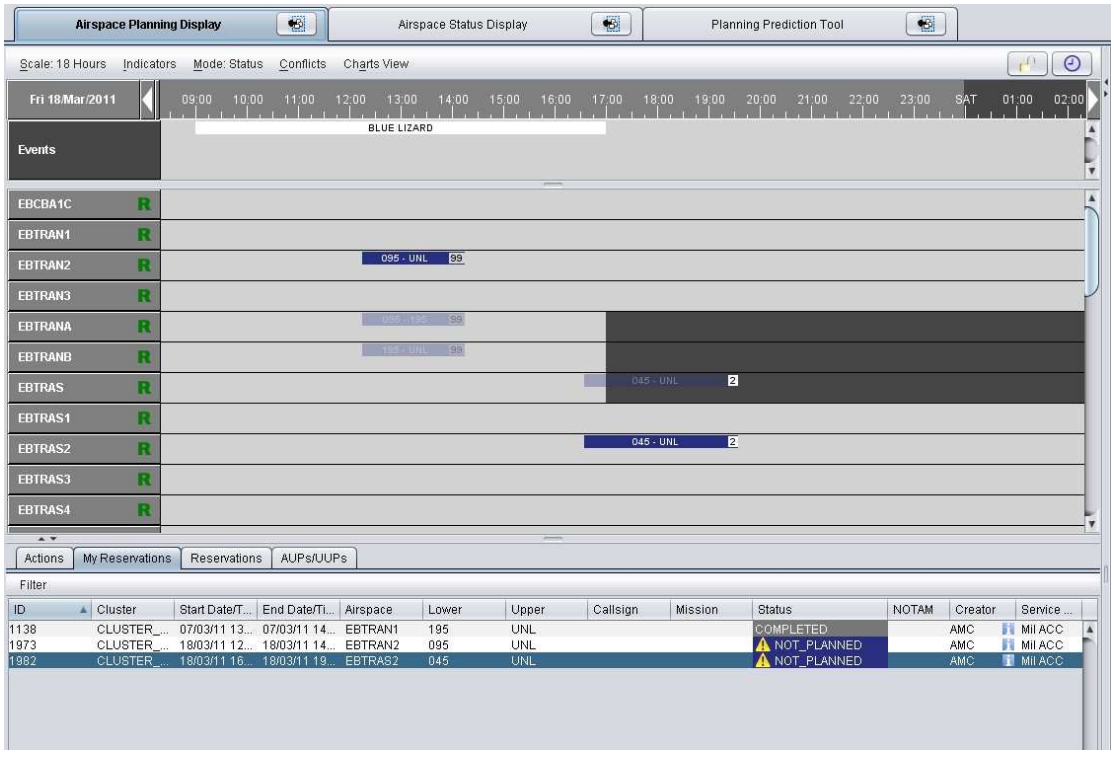


The Export Functionality is accessible from the Menu Bar.

This will open the *Export Events Window* allowing the user to specify the date- and time frame to be considered for export. After selecting the *Export Button* a standard window will open for saving the resulting file on a local hard disk drive or memory stick.

Exporting Events

Events can be edited and cancelled by users with *appropriate privileges*. In case of a cancellation, the event itself remains on the Planning Chart but changes colour to white. All linked reservations will lose their current status, return to the *NOT_PLANNED Status* and are displayed in blue as a result of the cancellation. If they are still valid despite the cancellation, they can be reactivated by editing and removing the link to the cancelled event.

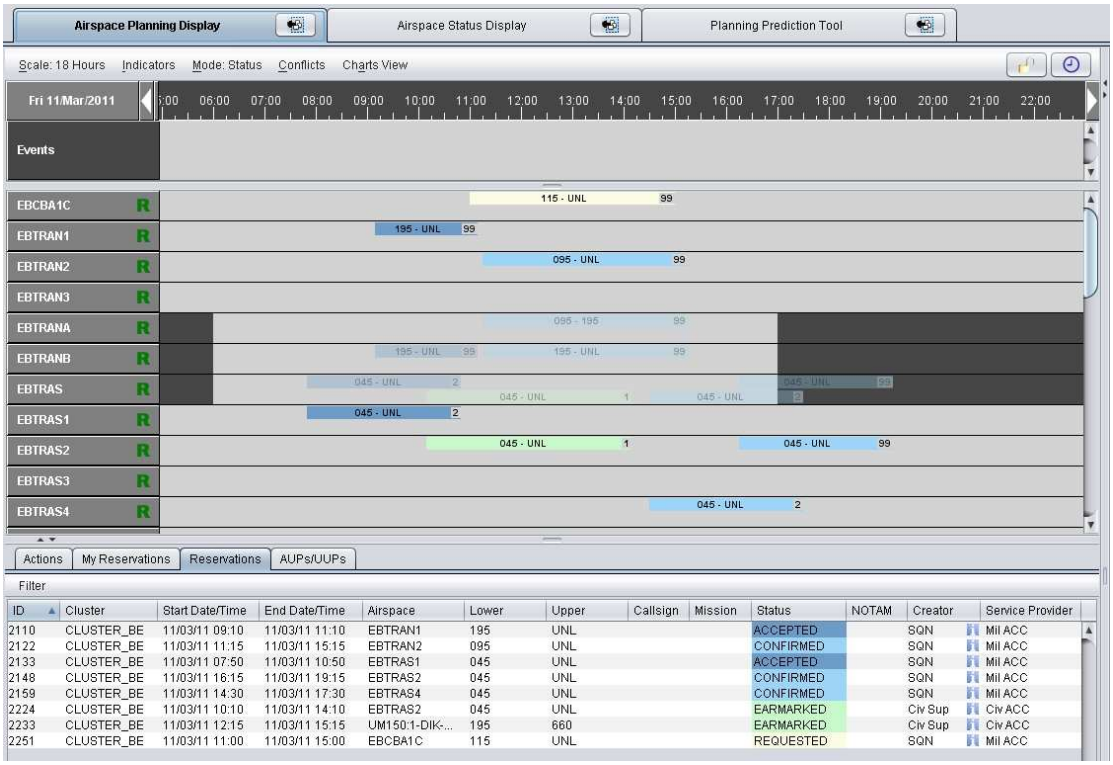


A cancelled Event and the linked reservations

4.13 Mode Selection / Radio Buttons

The display of information on the Airspace Planning Chart can be adapted to suit a wide variety of interests and uses. A supervisor of an Area Control Centre might be interested in other aspects of the data than a military Airspace Planner.

In order to configure the display of reservations according to these different uses, LARA offers so called Radio Buttons to change the colour-coding on the Planning Chart.

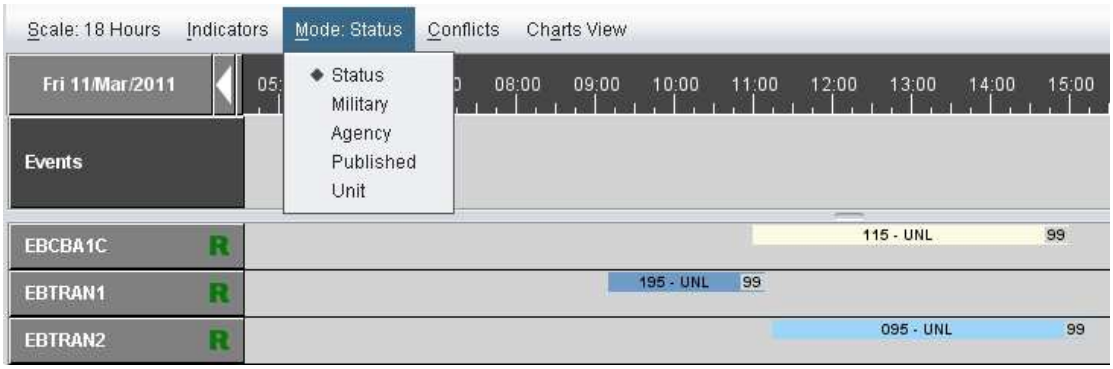


ID	Cluster	Start Date/Time	End Date/Time	Airspace	Lower	Upper	Callsign	Mission	Status	NOTAM	Creator	Service Provider
2110	CLUSTER_BE	11/03/11 09:10	11/03/11 11:10	EBTRAN1	195	UNL			ACCEPTED		SQN	Mil ACC
2122	CLUSTER_BE	11/03/11 11:15	11/03/11 15:15	EBTRAN2	095	UNL			CONFIRMED		SQN	Mil ACC
2133	CLUSTER_BE	11/03/11 07:50	11/03/11 10:50	EBTRAS1	045	UNL			ACCEPTED		SQN	Mil ACC
2148	CLUSTER_BE	11/03/11 16:15	11/03/11 19:15	EBTRAS2	045	UNL			CONFIRMED		SQN	Mil ACC
2159	CLUSTER_BE	11/03/11 14:30	11/03/11 17:30	EBTRAS4	045	UNL			CONFIRMED		SQN	Mil ACC
2224	CLUSTER_BE	11/03/11 10:10	11/03/11 14:10	EBTRAS2	045	UNL			EARMARKED		Civ Sup	Civ ACC
2233	CLUSTER_BE	11/03/11 12:15	11/03/11 15:15	UM150:1-DIK-...	195	660			EARMARKED		Civ Sup	Civ ACC
2251	CLUSTER_BE	11/03/11 11:00	11/03/11 15:00	EBCBA1C	115	UNL			REQUESTED		SQN	Mil ACC

Colours are according to reservation status per default

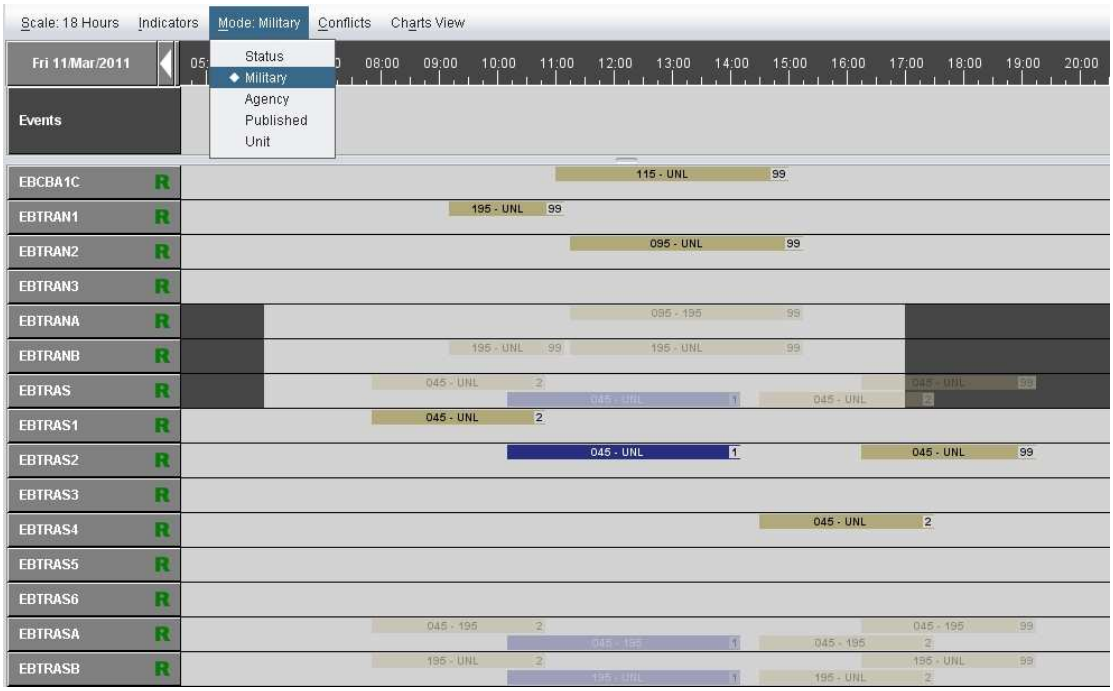
The default colour coding applied to the reservations on the Planning Chart is according to the status of a reservation. In *REQUESTED* Status the colour is white/beige, in the coordination phase (*CONFIRMED* and *ACCEPTED*) it takes on different shades of blue; when *APPROVED*, *ALLOCATED* and *REFERENCE ALLOCATED* different shades of green are used.

Via the *Mode: Status* Menu Item of the Airspace Planning Chart this colour coding can be changed to a variety of different colour schemes.



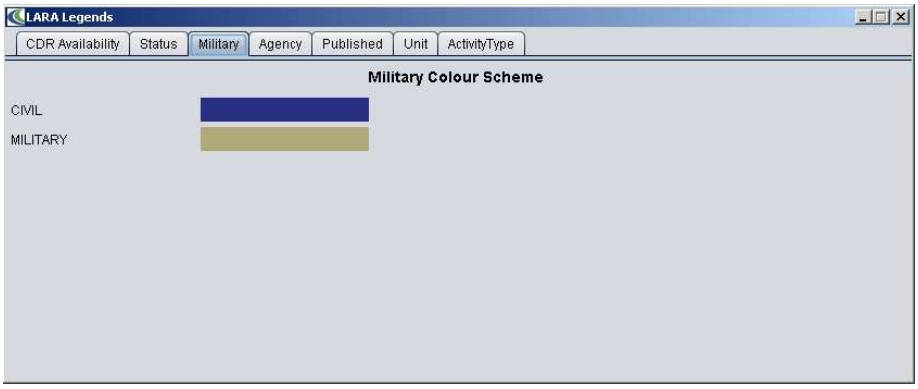
The colour coding can be changed via the Radio Buttons (Mode Selection)

Changing it to *Mode: Military* will change the colour coding to indicate if a reservation is used for a military or civil purpose. Reservations with a military *Booking Type* are coloured brown and with a civil Booking Type blue.



Colours are changed according to civil or military Booking Type

The applied colours per mode can be seen when selecting *Help → Legends* from the *Menu Bar*. The different modes can be selected and the appropriate colours are displayed.



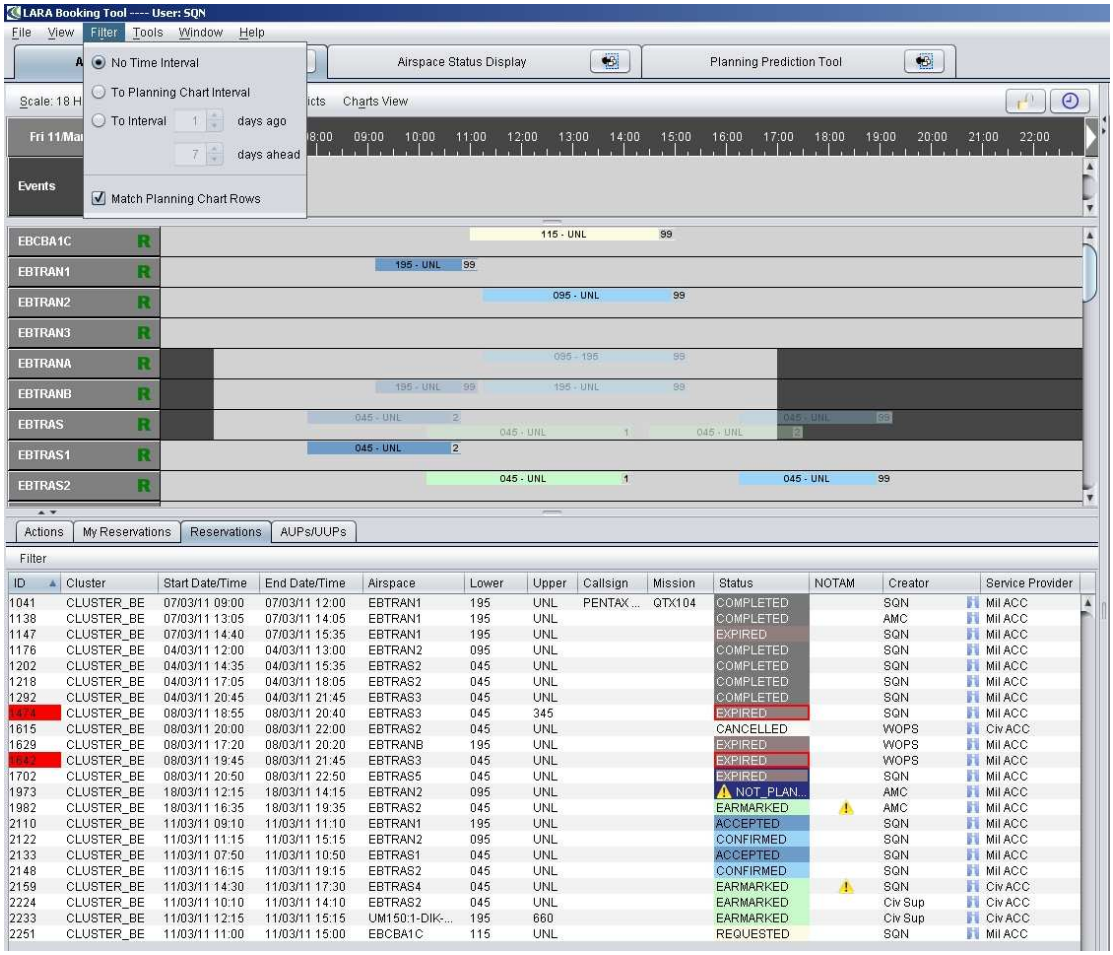
The Legends provide more information on the used colours

The available Radio Buttons (Mode Selections) are:

- *Status*: colours are applied according to the status of a reservation
- *Military*: colours are applied according to the Booking Type (civil or military)
- *Agency*: colours are applied according to the responsible service provider (agency) selected
- *Published*: colours are applied according to the status in regard to AUP/UUP Publication (published or not published).
- *Unit*: colours are applied according to the originating unit of a reservation

4.14 Additional Filters for the Airspace Planning Display

The Airspace Planning Display will hold a significant amount of data that can be accessed and displayed. In order to provide users the option to focus on essential data a number of filters have been implemented. Some filtering options have already been discussed in earlier sections.

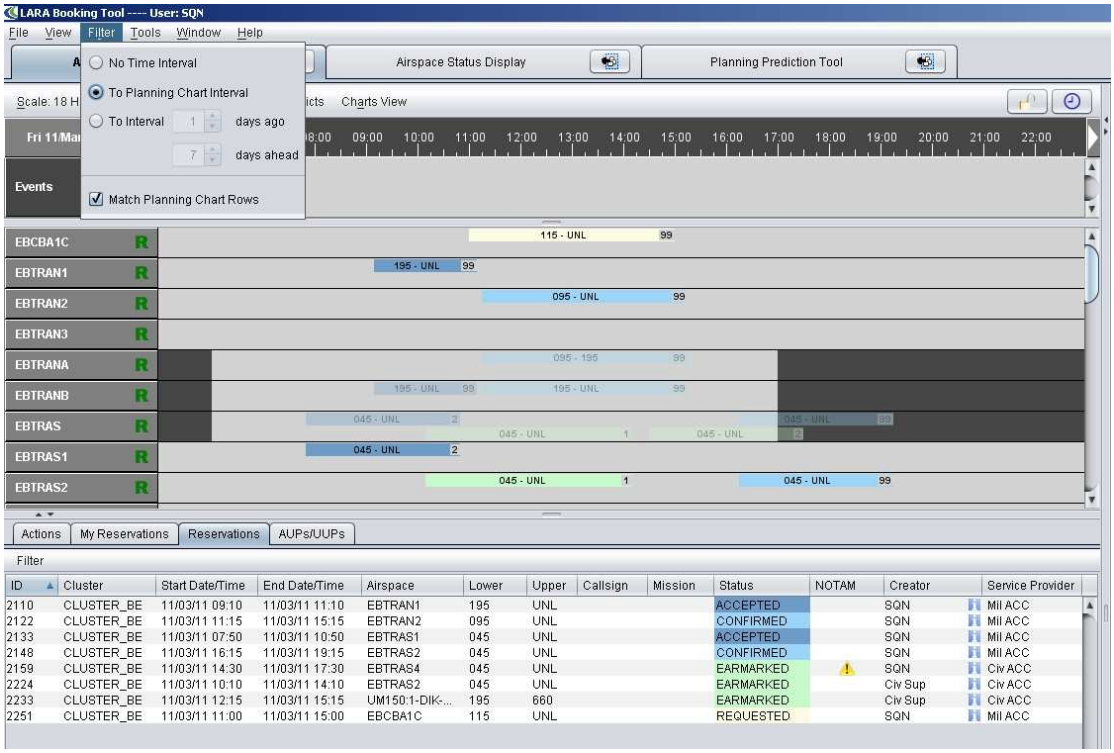


ID	Cluster	Start Date/Time	End Date/Time	Airspace	Lower	Upper	Callsign	Mission	Status	NOTAM	Creator	Service Provider
1041	CLUSTER_BE	07/03/11 09:00	07/03/11 12:00	EBTRAN1	195	UNL	PENTAX ...	QTX104	COMPLETED		SQN	Mil ACC
1138	CLUSTER_BE	07/03/11 13:05	07/03/11 14:05	EBTRAN1	195	UNL			COMPLETED		AMC	Mil ACC
1147	CLUSTER_BE	07/03/11 14:40	07/03/11 15:35	EBTRAN1	195	UNL			EXPIRED		SQN	Mil ACC
1176	CLUSTER_BE	04/03/11 12:00	04/03/11 13:00	EBTRAN2	095	UNL			COMPLETED		SQN	Mil ACC
1202	CLUSTER_BE	04/03/11 14:35	04/03/11 15:35	EBTRAS2	045	UNL			COMPLETED		SQN	Mil ACC
1218	CLUSTER_BE	04/03/11 17:05	04/03/11 18:05	EBTRAS2	045	UNL			COMPLETED		SQN	Mil ACC
1292	CLUSTER_BE	04/03/11 20:45	04/03/11 21:45	EBTRAS3	045	UNL			COMPLETED		SQN	Mil ACC
1474	CLUSTER_BE	08/03/11 18:55	08/03/11 20:40	EBTRAS3	045	345			EXPIRED		SQN	Mil ACC
1615	CLUSTER_BE	08/03/11 20:00	08/03/11 22:00	EBTRAS2	045	UNL			CANCELLED		WOPS	Civ ACC
1629	CLUSTER_BE	08/03/11 17:20	08/03/11 20:20	EBTRANB	195	UNL			EXPIRED		WOPS	Mil ACC
1642	CLUSTER_BE	08/03/11 19:45	08/03/11 21:45	EBTRAS3	045	UNL			EXPIRED		WOPS	Mil ACC
1702	CLUSTER_BE	08/03/11 20:50	08/03/11 22:50	EBTRAS5	045	UNL			EXPIRED		SQN	Mil ACC
1973	CLUSTER_BE	18/03/11 12:15	18/03/11 14:15	EBTRAN2	095	UNL			NOT_PLAN...		AMC	Mil ACC
1982	CLUSTER_BE	18/03/11 16:35	18/03/11 19:35	EBTRAS2	045	UNL			EARMARKED		AMC	Mil ACC
2110	CLUSTER_BE	11/03/11 09:10	11/03/11 11:10	EBTRAN1	195	UNL			ACCEPTED		SQN	Mil ACC
2122	CLUSTER_BE	11/03/11 11:15	11/03/11 15:15	EBTRAN2	095	UNL			CONFIRMED		SQN	Mil ACC
2133	CLUSTER_BE	11/03/11 07:50	11/03/11 10:50	EBTRAS1	045	UNL			ACCEPTED		SQN	Mil ACC
2148	CLUSTER_BE	11/03/11 16:15	11/03/11 19:15	EBTRAS2	045	UNL			CONFIRMED		SQN	Mil ACC
2159	CLUSTER_BE	11/03/11 14:30	11/03/11 17:30	EBTRAS4	045	UNL			EARMARKED		SQN	Civ ACC
2224	CLUSTER_BE	11/03/11 10:10	11/03/11 14:10	EBTRAS2	045	UNL			EARMARKED		Civ Sup	Civ ACC
2233	CLUSTER_BE	11/03/11 12:15	11/03/11 15:15	UM150:1-DIK-...	195	660			EARMARKED		Civ Sup	Civ ACC
2251	CLUSTER_BE	11/03/11 11:00	11/03/11 15:00	EBCBA1C	115	UNL			REQUESTED		SQN	Mil ACC

Without using filters the display can become cluttered

There are two obvious *filter menus* available on the Airspace Planning Display. The main menu on top of the window allows filtering of the Planning Information Display (effective on the *Reservations Tab* and the *My Reservations Tabs* only) according to different time intervals and the configuration of the Planning Chart. One of these filtering options has an effect on the Airspace Visualization Display as well.

If *No Time Interval* is selected, all reservations contained in the system will be displayed on the Planning Information Display.

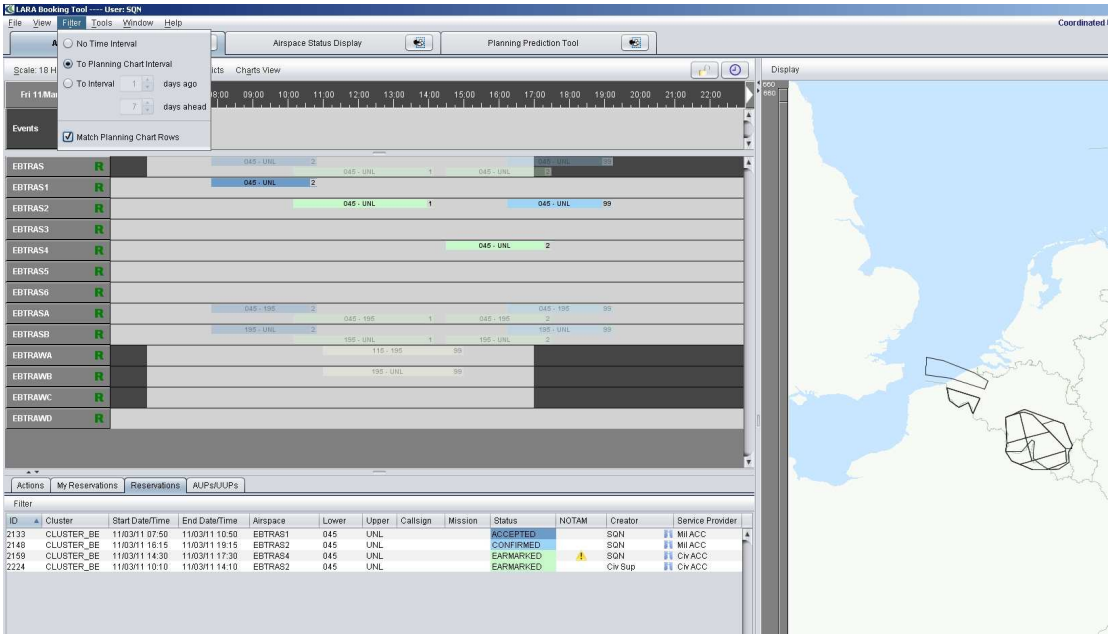

LARA Booking Tool ---- User: SQN
File View Filter Tools Window Help
No Time Interval
To Planning Chart Interval
To Interval
days ago
days ahead
Match Planning Chart Rows
Airspace Status Display
Planning Prediction Tool
Charts View
Events
EBCBA1C
EBTRAN1
EBTRAN2
EBTRAN3
EBTRANA
EBTRANB
EBTRAS
EBTRAS1
EBTRAS2
Actions
My Reservations
Reservations
AUPs/UUPs
Filter
ID Cluster Start Date/Time End Date/Time Airspace Lower Upper Callsign Mission Status NOTAM Creator Service Provider
2110 CLUSTER_BE 11/03/11 09:10 11/03/11 11:10 EBTRAN1 195 UNL ACCEPTED SQN Mil ACC
2122 CLUSTER_BE 11/03/11 11:15 11/03/11 15:15 EBTRAN2 095 UNL CONFIRMED SQN Mil ACC
2133 CLUSTER_BE 11/03/11 07:50 11/03/11 10:50 EBTRAS1 045 UNL ACCEPTED SQN Mil ACC
2148 CLUSTER_BE 11/03/11 16:15 11/03/11 19:15 EBTRAS2 045 UNL CONFIRMED SQN Mil ACC
2159 CLUSTER_BE 11/03/11 14:30 11/03/11 17:30 EBTRAS4 045 UNL EARMARKED SQN Civ ACC
2224 CLUSTER_BE 11/03/11 10:10 11/03/11 14:10 EBTRAS2 045 UNL EARMARKED Civ Sup Civ ACC
2233 CLUSTER_BE 11/03/11 12:15 11/03/11 15:15 UM150:1-DIK-... 195 660 EARMARKED Civ Sup Civ ACC
2251 CLUSTER_BE 11/03/11 11:00 11/03/11 15:00 EBCBA1C 115 UNL REQUESTED SQN Mil ACC

The Planning Information Display is now filtered to the Planning Chart Interval

Selecting the filter option *To Planning Chart Interval* will only display those reservations in the PID that fall into the time frame selected for the Planning Chart.

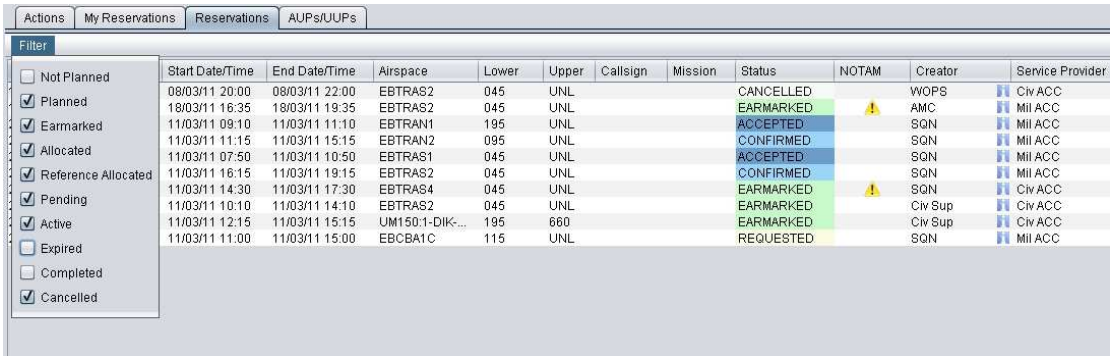
Via the third option a *floating interval* can be specified that should be displayed. Selecting e.g. *“0 days ago” and “0 days ahead”* will display only reservations from the current day. Selecting “0 days ago” and “1 days ahead” will display reservations from today and tomorrow, etc.

The final option from the main filter menu has an effect on the PID and the AVD. Selecting the *Match Planning Chart Rows* option will only display reservations in the PID and airspaces on the AVD that are selected for display on the Airspace Planning Chart via the *Window → Preference Option*. In the illustration below the list of airspaces on the Planning Chart has been significantly reduced, which results in lesser reservations displayed on the PID and lesser airspaces on the AVD.



The "Match Planning Chart Rows" Filter has an effect on the PID and the AVD

The Filter Menu on the PID itself allows filtering the reservations on the PID according to their *status*. All states that are check-marked will be visible. Reservations with the checkmark removed will be hidden from view.


Actions
My Reservations
Reservations
AUPs/UUPs
Filter
Not Planned
Planned
Earmarked
Allocated
Reference Allocated
Pending
Active
Expired
Completed
Cancelled
Start Date/Time End Date/Time Airspace Lower Upper Callsign Mission Status NOTAM Creator Service Provider
08/03/11 20:00 08/03/11 22:00 EBTRAS2 045 UNL CANCELLED WOPS Civ ACC
18/03/11 16:35 18/03/11 19:35 EBTRAS2 045 UNL EARMARKED AMC Mil ACC
11/03/11 09:10 11/03/11 11:10 EBTRAN1 195 UNL ACCEPTED SQN Mil ACC
11/03/11 11:15 11/03/11 15:15 EBTRAN2 095 UNL CONFIRMED SQN Mil ACC
11/03/11 07:50 11/03/11 10:50 EBTRAS1 045 UNL ACCEPTED SQN Mil ACC
11/03/11 16:15 11/03/11 19:15 EBTRAS2 045 UNL CONFIRMED SQN Mil ACC
11/03/11 14:30 11/03/11 17:30 EBTRAS4 045 UNL EARMARKED SQN Civ ACC
11/03/11 10:10 11/03/11 14:10 EBTRAS2 045 UNL EARMARKED Civ Sup Civ ACC
11/03/11 12:15 11/03/11 15:15 UM150:1-DIK-... 195 660 EARMARKED Civ Sup Civ ACC
11/03/11 11:00 11/03/11 15:00 EBCBA1C 115 UNL REQUESTED SQN Mil ACC

Filter the PID according to Status

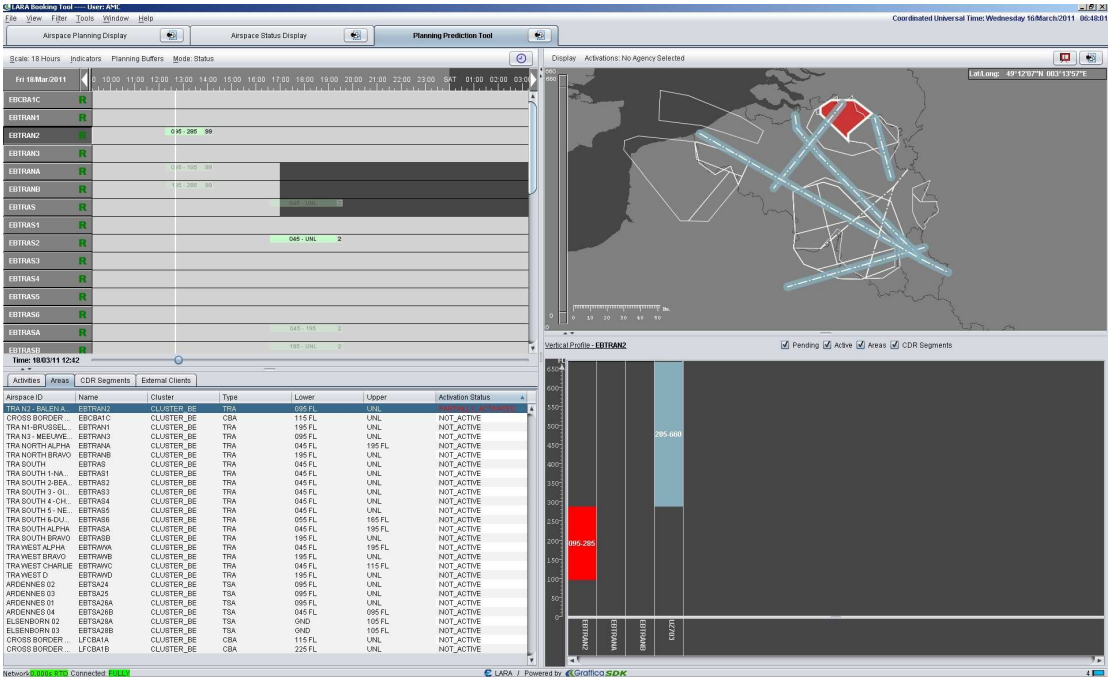
5 Planning Prediction and Optimization

5.1 Planning Prediction Tool (PPT)

The *Planning Prediction Tool* provides airspace managers with the means to advance in time and obtain an overview over scheduled airspace activations and the resulting effect on the conditional route network. The aim is to identify and spot opportunities for airspace allocation improvements.

Alternative scenarios can be simulated using the PPT with options to automatically communicate an improved allocation to affected users as proposals.

The PPT is working on local and multi-cluster level, i.e. in one cluster only and across multiple clusters. It is therefore possible for a FAB or the Military Liaison Officers at Network Level to use this tool for airspace allocation assessment.



The Planning and Prediction Tool

The PPT is accessed via selecting the appropriate tab at the top of the HMI.

5.2 The PPT – HMI and usage

The HMI of the PPT is very similar to the Planning Display and most filters and functions available on the PPT were already explained in the Section on the Airspace Planning Display. For that reason, only PPT specific functions

will be explained in this section. Please refer to the earlier chapters to acquire more information on the HMI basics.

In line with the Airspace Planning Display the HMI contains a planning chart, an airspace map and an additional information display. Below the map a vertical view is added. The PPT will simulate airspace activations at a definable moment in time; the map view and the vertical view will visualize the airspace status accordingly.

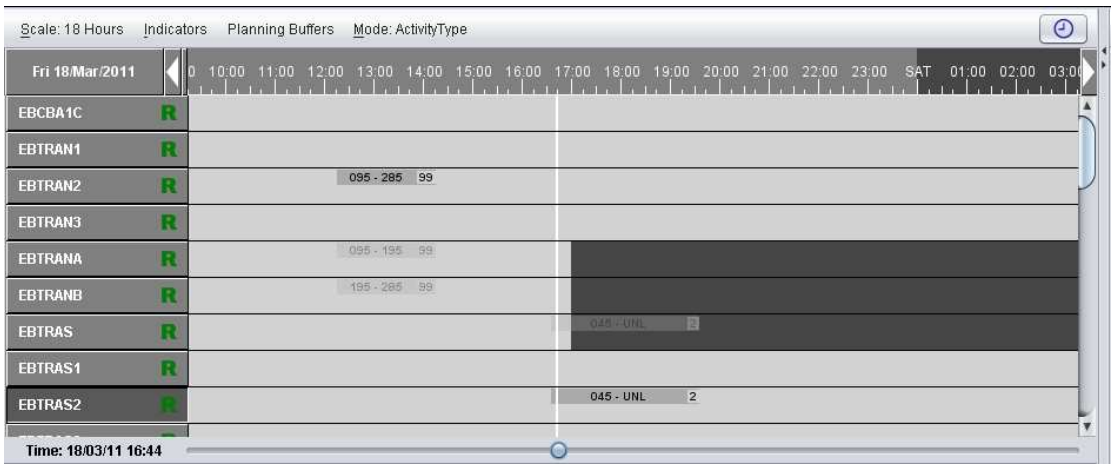
The contents of the PPT Planning Chart is a copy of the reservations found on the Airspace Planning Display; the difference being that the Mode/Radio Button is selected to Activity Type, and hence the colours of the reservation bars are different. It will become later obvious why this is a suitable mode to work with on the PPT.

5.2.1 Time Prediction Indicator

On the bottom of the Planning Chart of the PPT a slider is available, which allows the user to move the Prediction Time Indicator across the Planning Chart.

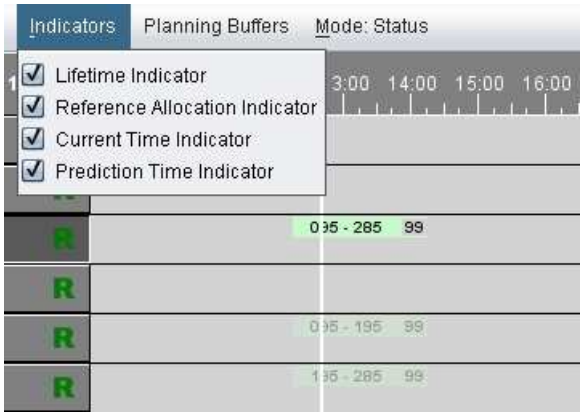
The Prediction Time Indicator is the vertical white line displayed on the Planning Chart. The other windows of the PPT will display the situation that is foreseen at the position of the Prediction Time Indicator. It can be moved by clicking the connected slider with the mouse button and moving it left and right.

In line with the Airspace Planning Display, the user can select any time frame and scale to work on with the Prediction Line. At the left lower side of the PPT Planning Tab the currently selected time is displayed.



The Planning Chart of the PPT showing the Prediction Time Indicator

The Prediction Time Indicator can be enabled and disabled by (de-)selecting the appropriate entry in the *Indicators Menu*.

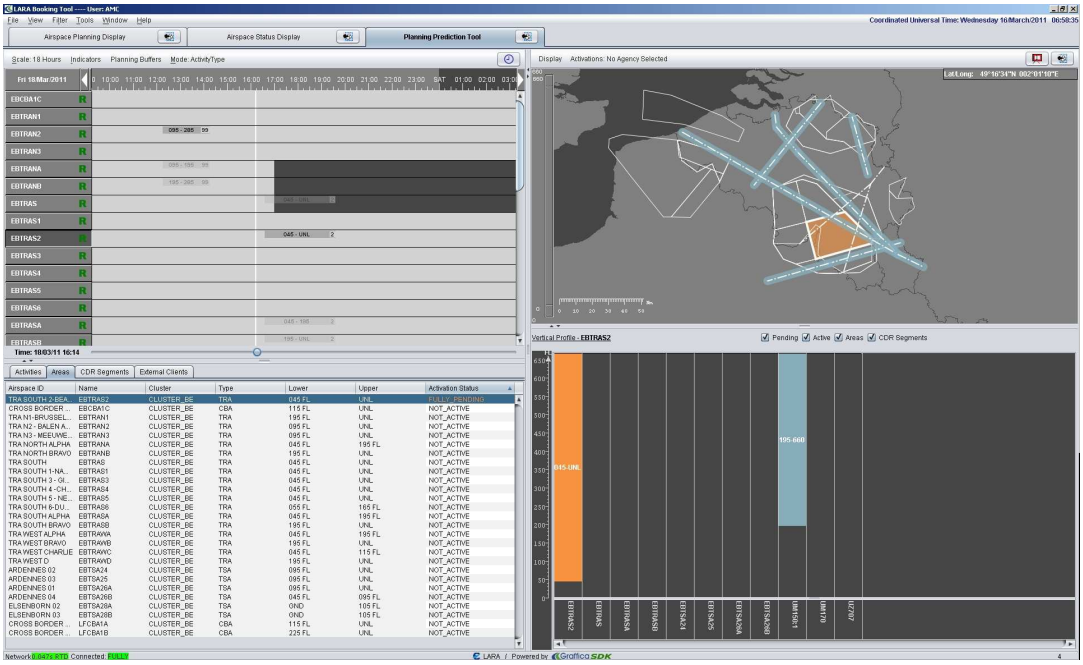


The Indicators Menu on the PPT

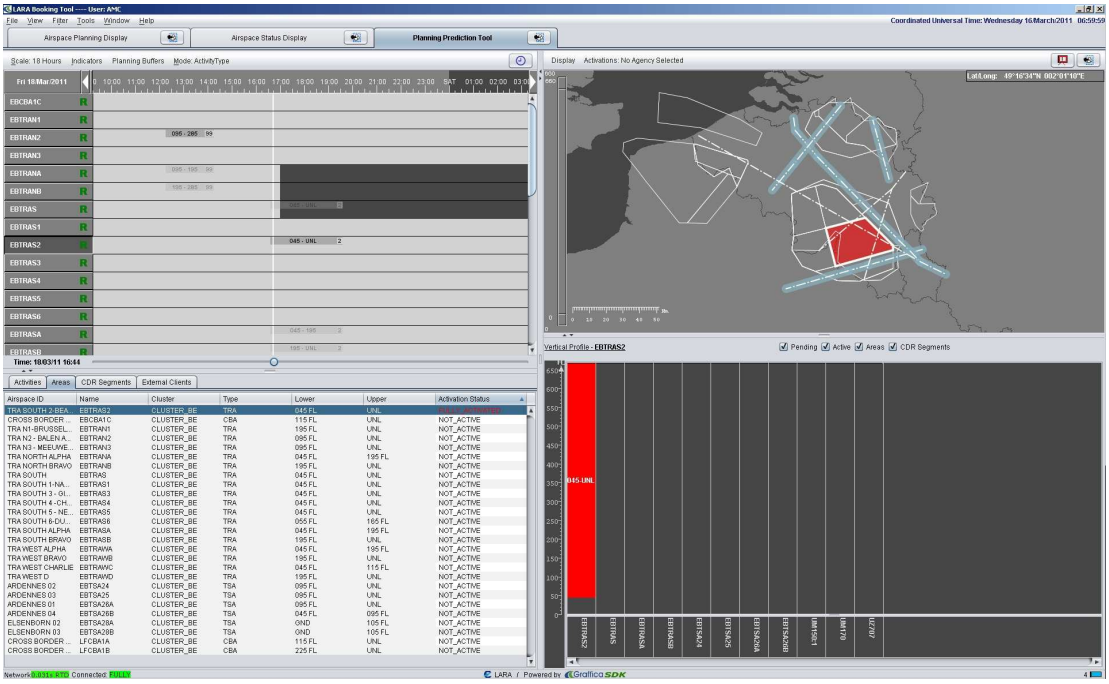
5.2.2 PPT Airspace Status and Colours

The two displays on the right side of the PPT will display the airspace status according to the selected prediction time. The top display is showing the lateral view, the bottom display a vertical view for the given time and a selected airspace. The following colours are used to indicate the status:

- Orange is used to indicate the Pending Status of an area. The area is not yet active, but according to the plan it will become active a pre-defined time in the future (default is set to 20 minutes), i.e. the area will turn orange 20 minutes prior the planned activation.
- Red is indicating that an area is currently active and not available.
- Green is indicating that an area is active and available for use.
- Blue is used for CDRs and indicates (at least partial) availability. If at least one flight level is available the CDR will be displayed as available in blue. If the CDR is completely not available it is displayed without colour.

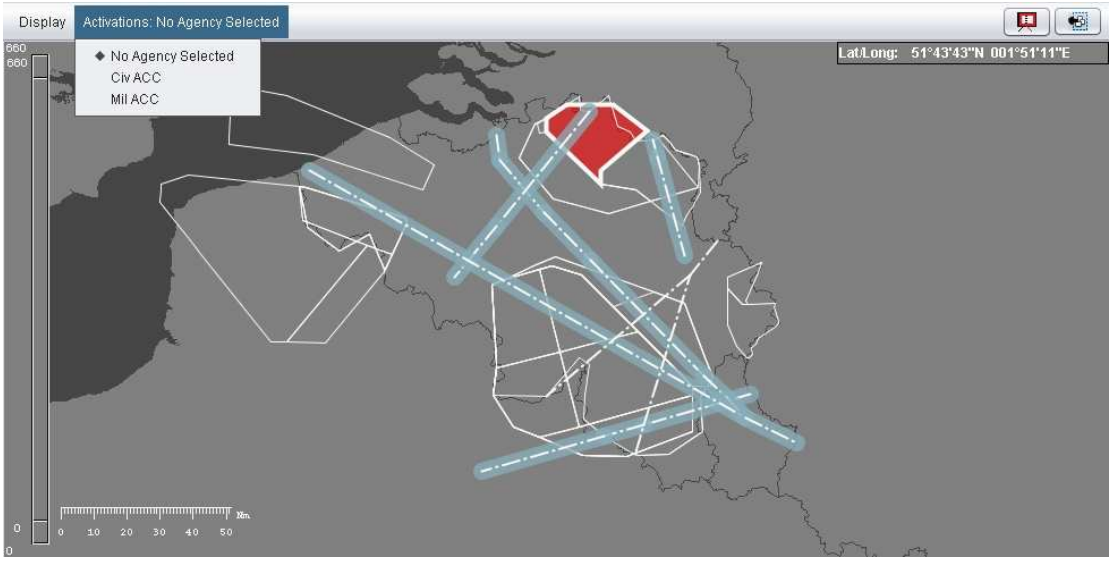


The colours used for the different stati on the PPT until moving the Prediction Time Slider



After moving the Prediction Time Slider into the future the stati of the selected airspaces changed

Note: The use of green or red is dependent on the Agency a user belongs to. If the user's agency is selected as the Service Provider for a reservation, the areas will be displayed in green indicating availability. For other agencies or for users not connected to any agencies it will be displayed red. Users not assigned to any agency can select which agencies view they prefer to see via selecting the appropriate agency from the Activations Menu on the Airspace Display. If no agency view is selected, all active areas are displayed in red.



The user is not assigned to an agency and can select the view as required

5.2.3 PPT Vertical View

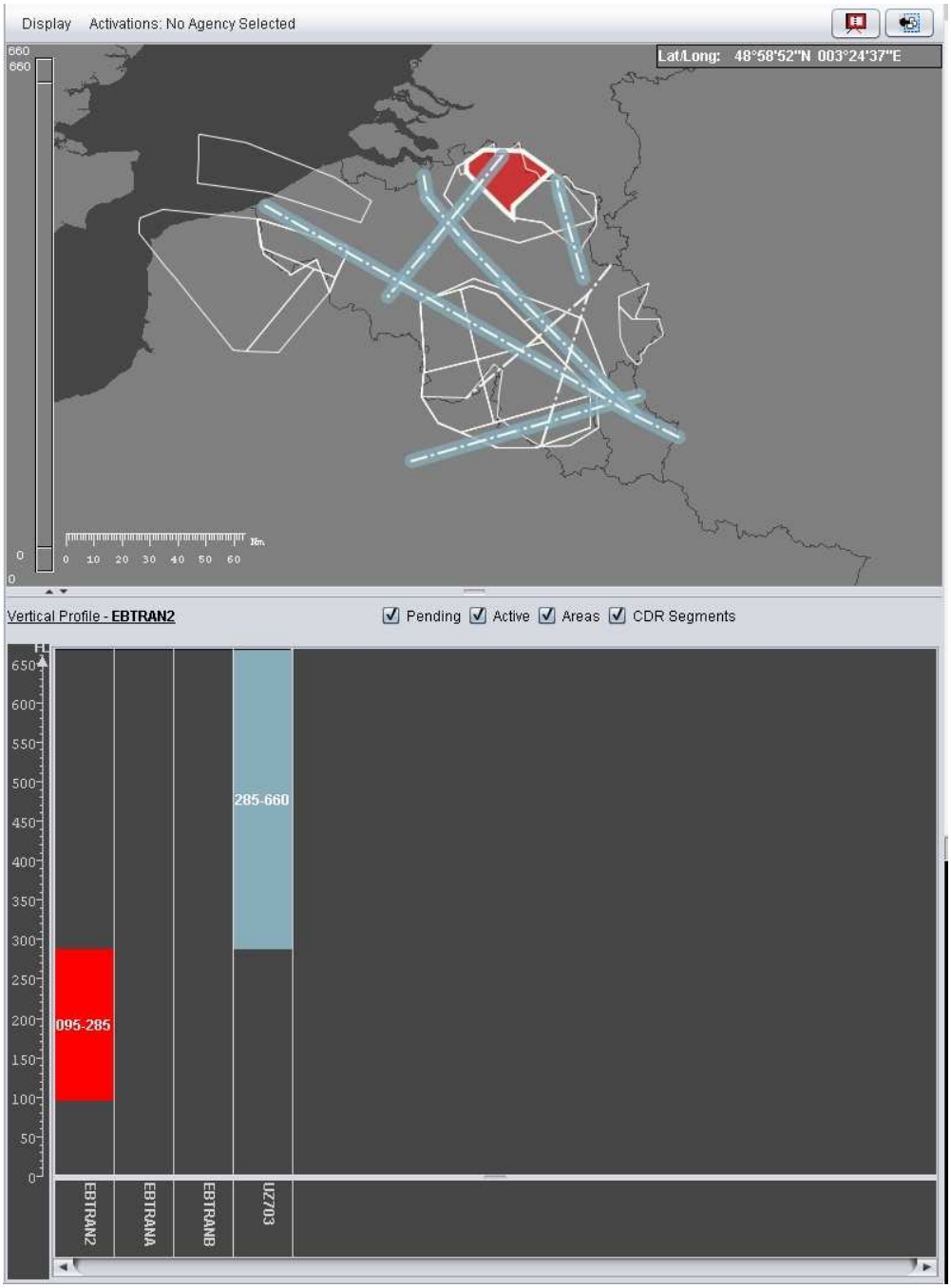
Per default, the vertical status display is located beneath the lateral display.

The Vertical View follows a certain logic that is applicable throughout the LARA Application. An airspace (area or CDR) is selected on the Area or CDR Segments Tab, which is then displayed on the vertical display on the left hand side column. The airspace can also be selected on the Planning Chart by clicking the area of interest.

Airspace ID	Name	Cluster	Type	Lower	Upper	Activation Status
TRA SOUTH 2-BEAURA...	EBTRAS2	CLUSTER_BE	TRA	045 FL	UNL	FULLY_ACTIVATED
TRA SOUTH 5 - NEUFC...	EBTRAS5	CLUSTER_BE	TRA	045 FL	UNL	FULLY_ACTIVATED
TRA NORTH ALPHA	EBTRANA	CLUSTER_BE	TRA	045 FL	195 FL	PARTIALLY_PENDING
CROSS BORDER AREA...	EBCBA1C	CLUSTER_BE	CBA	115 FL	UNL	NOT_ACTIVE
TRA N1-BRUSSELS AR...	EBTRAN1	CLUSTER_BE	TRA	195 FL	UNL	NOT_ACTIVE
TRA N2 - BALEN AREA	EBTRAN2	CLUSTER_BE	TRA	095 FL	UNL	NOT_ACTIVE
TRA N3 - MEEUWEN A...	EBTRAN3	CLUSTER_BE	TRA	095 FL	UNL	NOT_ACTIVE
TRA NORTH BRAVO	EBTRANB	CLUSTER_BE	TRA	195 FL	UNL	NOT_ACTIVE
TRA SOUTH	EBTRAS	CLUSTER_BE	TRA	045 FL	UNL	NOT_ACTIVE
TRA SOUTH 1-NAMUR ...	EBTRAS1	CLUSTER_BE	TRA	045 FL	UNL	NOT_ACTIVE
TRA SOUTH 3 - GIVET A...	EBTRAS3	CLUSTER_BE	TRA	045 FL	UNL	NOT_ACTIVE
TRA SOUTH 4 -CHARL...	EBTRAS4	CLUSTER_BE	TRA	045 FL	UNL	NOT_ACTIVE
TRA SOUTH 6-DURBU...	EBTRAS6	CLUSTER_BE	TRA	055 FL	165 FL	NOT_ACTIVE
TRA SOUTH ALPHA	EBTRASA	CLUSTER_BE	TRA	045 FL	195 FL	NOT_ACTIVE
TRA SOUTH BRAVO	EBTRASB	CLUSTER_BE	TRA	195 FL	UNL	NOT_ACTIVE

An area selected on the Areas Tab of the PPT

Note: The different tabs (APD, ASD and PPT) are linked. Clicking or hovering over an area of interest on the APD has for example an effect on the PPT or ASD.



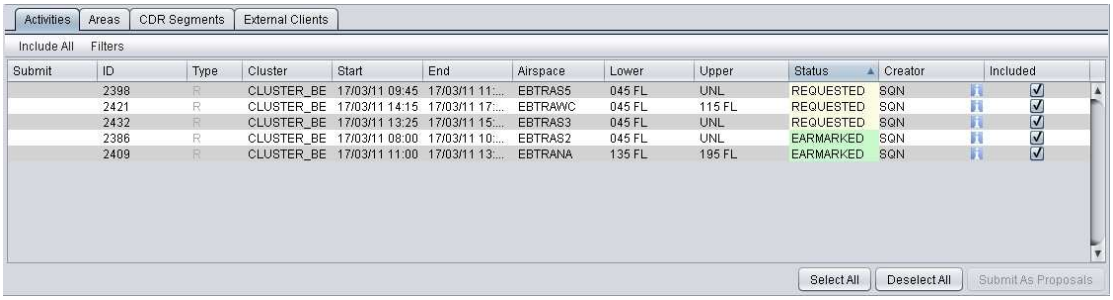
The Airspace Status in lateral (top) and vertical view (bottom)

On the left hand side the vertical view of the selected airspace is displayed. To the right of it all overlapping airspaces (areas and CDRs) are shown with their respective vertical activation status. This allows assessing the vertical effect of an activation on overlapping areas and CDRs. The names of the airspaces are available at the bottom of the display. The FLs on the left hand side. To simplify the display, altitudes are translated into FLs assuming ISO Standard Atmosphere, i.e. A50 = FL050.

5.2.4 PPT Activities Tab

The PPT Information Display has four tabs displaying additional information.

- The Area and CDR Segment Tab provide additional information on the airspaces and their activation status.
- The External Clients Tab is not of interest on the PPT, but will have significance on the Airspace Status Display, which will be explained in Chapter 7.
- The Activities Tab is the default tab and provides additional information on the activities (reservations) that are foreseen within the time frame selected for the PPT.



The Activities Tab displaying the reservations for the selected time period

5.2.5 PPT Filters

The Filters on the different Tabs (APD, ASD and PPT) are adapted to suit each display's task. On the PPT the following filters are available:

- Foreign – unselecting this check mark will hide all foreign airspaces and only leave the airspaces and activities visible that are defined on the local cluster.
- Not Active – de-selecting this check mark will hide all non-active airspaces (i.e. neither Active nor Pending) on the lateral and vertical status map and from the Areas and CDR Segment Tabs of the PPT Information Display.
- Match Planning Chart Rows – de-selecting this check mark will show all airspaces defined in the local and foreign (if connected) clusters – regardless of what has been selected for view in the Preferences Menu. Selecting it will only show those that have been selected for display in the Preferences Menu.

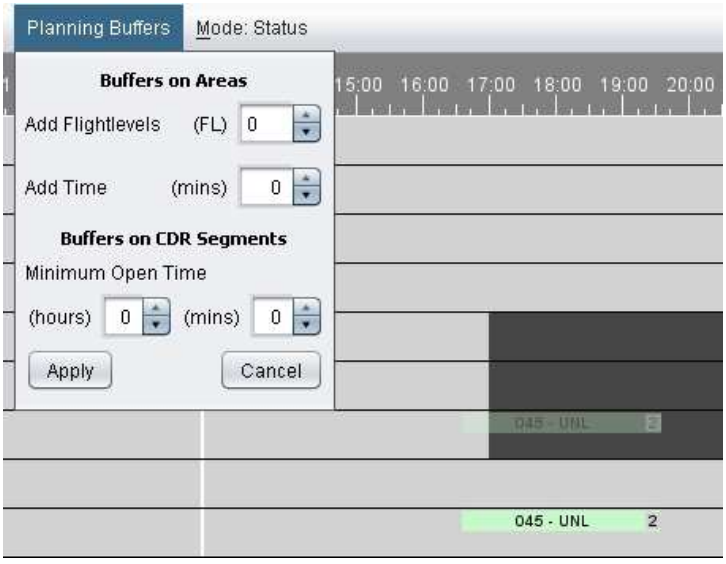
Filter on the PPT

The Vertical Display can be further filtered by using the filter check marks between the two status views. Deselecting a checkmark will remove the de-selected item from the display.

5.2.6 PPT Planning Buffers

Per default, the interactions on the PPT between areas and CDRs are calculated without any buffers or minimum opening times taken into consideration: as soon as an area turns inactive the overlapping CDR Segment will immediately be displayed as available, which might lead to unrealistic results.

In order to obtain a better result, the user can add time and flight level buffers as well as minimum opening times for CDR Segments via the Planning Buffers Menu above the PPT Planning Chart.



The available Planning Buffers on the PPT

The effect of each Planning Buffer is as follows:

- Add Flightlevels – This setting has an effect on the displayed availability of CDR Segment FLs. If the buffer is set to “0” an area reservation from GND to FL185 will show the overlapping CDR Segment to be available from FL 185 upwards. If the flight level buffer is set to “10” the CDR Segment will be indicated as available from FL195. The minimum increment is “5”, being effectively one half flight level.

- Add Time – This setting adds the selected time buffer before and after an area reservation when calculating the resulting CDR Availability. Example: If set to 5 minutes and the area activation starts at 12:50 and ends at 13:50, the CDR will be shown as available before 12:45 and after 13:55.

- Minimum Opening Time – This specifies a minimum time that a CDR Segment must be available before it is shown as available on the PPT. This shall ensure that only usable CDR openings are displayed, e.g. an opening of 5 minutes will hardly be usable by enroute traffic.

Press the Apply button for the buffer(s) to take affect; or the Cancel Button to close the window without changes taking effect.

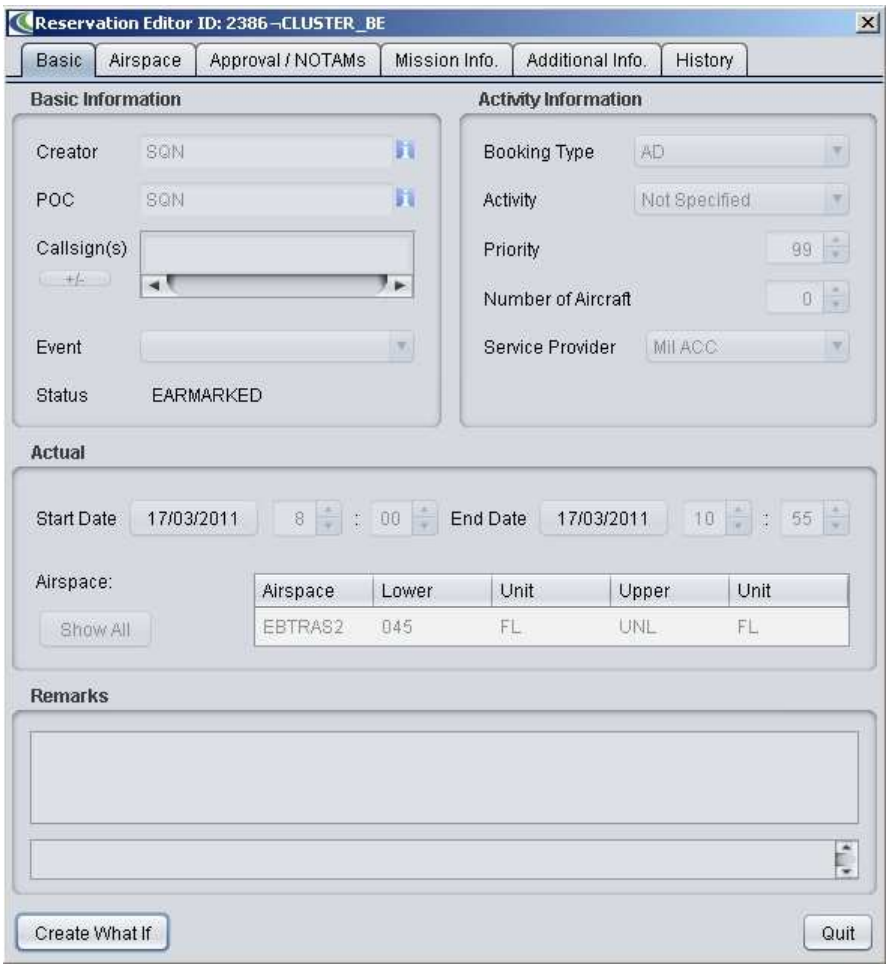
5.3 What-If Functionality

The aim of using the PPT is to optimize the airspace allocation. In order to do so the PPT provides the *What-If* functionality, which enables an airspace manager to re-arrange the airspace allocation on a trial-and-error basis until a suitable solution is found. Afterwards the new allocation is communicated and proposed automatically to connected LARA Clients via the proposal functionality.

5.3.1 Creating and assessing What-Ifs

In order to change the airspace allocation and create a What-If, the user can either double click a reservation bar on the PPT Planning Chart or double click an activity in the Actitvity Tab of the PPT. The Airspace Reservation Editor for the chosen reservation will open with the option to change it on the PPT via the *Create What If* Button.

Note: Creating a What-If will only be visible on the PPT of the local LARA Client. The actual airspace allocation will not be touched until What-Ifs are turned into Proposals. This process will be explained later in this chapter.



The Reservation Editor on the PPT – offering the option to create a What-If

Selecting the *Create What If* Button opens a window to allow changing the essential fields of the reservation to create a *What-If*. It allows the following changes:

- Moving the reservation in time via changing the time and date fields or dragging the reservation bar on the planning chart of the PPT.
- Changing the vertical placement of the reservation by adapting the lower and upper limits of the reservation
- Choosing a different area or a different combination of areas for the reservation via the adding and removing airspace between the *Available Airspace Section* and the *Selected Airspace Section* of the *What-If-Editor*.

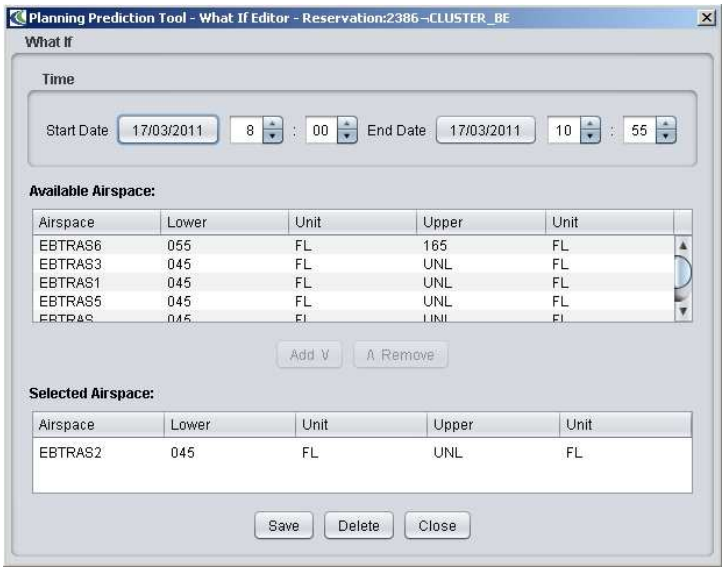
Any combination of the three options is feasible.

The details of adapting fields of reservations have been described in earlier chapters on the Airspace Reservation Editor. Please refer to these in case more details are required.

After the changes are complete, press the *Save Button* for the What-If to take effect and be visible on the PPT Planning Chart.

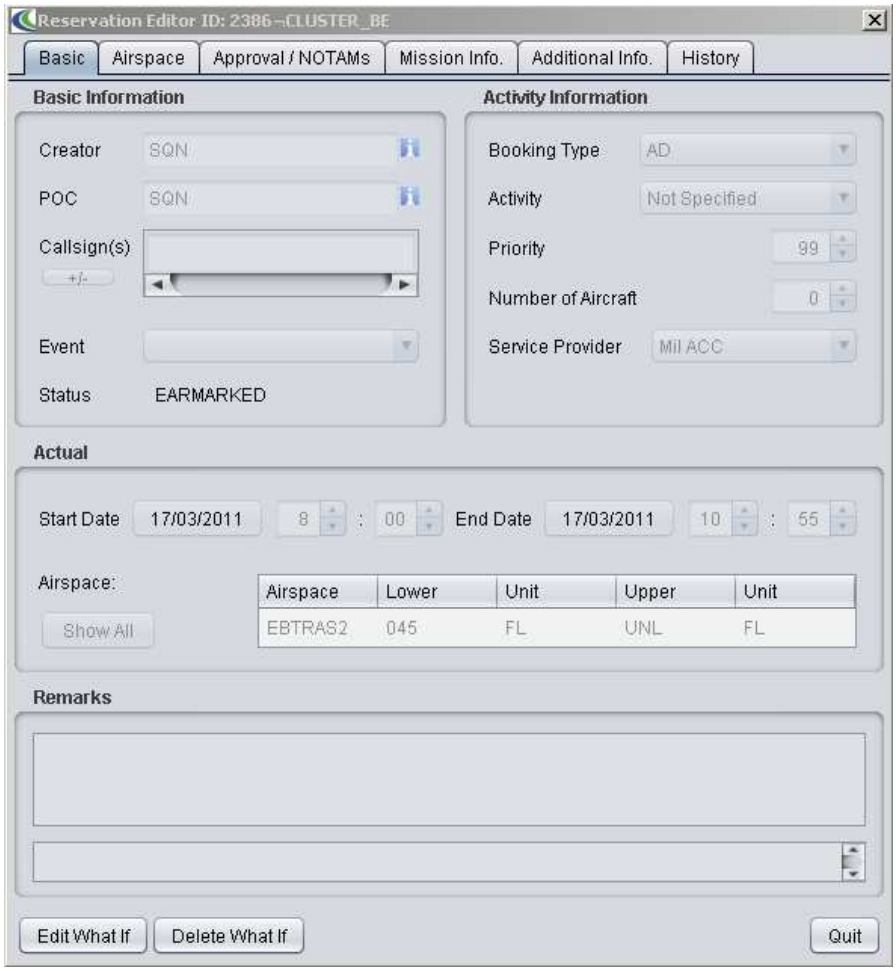
The *Delete Button* will delete any What-Ifs connected to this reservation and close the Editor at the same time.

The *Close Button* will close the window- retaining any previously entered What-Ifs.



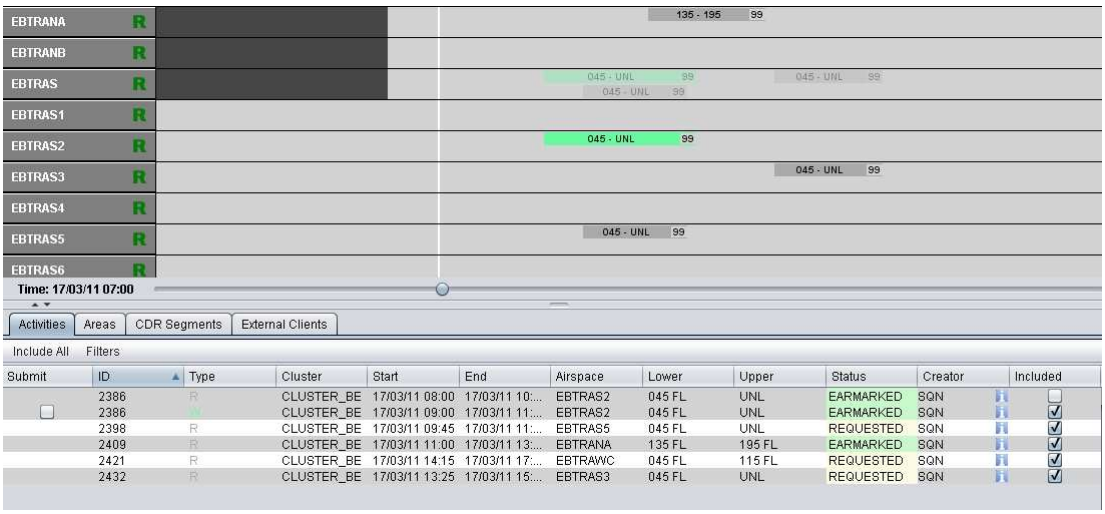
The What If Editor of the PPT

After the What-If-Editor is closed the ARE will still be open with the options to close it via the *Cancel Button*. Other options are to *Delete* or *Edit* the What-If via the corresponding buttons.



The ARE with the option to Edit or Delete a What-If

The What-If will be displayed in green on the PPT Planning Display. Now it will be obvious why the colour scheme on the PPT is different than on the Planning Display. It allows the user to quickly identify which reservations are in their original state and for which a What-If has been created.



The What-If Display on the Planning Chart

The *Activities Tab* will show that the What-If has been added one line below the original reservation marked with a *green "W"* as opposed to the original reservations, which are marked by a *grey "R".* Additionally the background colour is alternating from row to row – from white to light grey. The *What-If-Row* has received the same background colour as its original reservation to quickly identify that these two rows are connected to each other.

The user has now the option to use the *Prediction Time Slider* again and observe the effect of the What-If Reservation on the airspace allocation. It is as well possible to look again at the original allocation to be able to compare *"What-If" allocation vs "Original" allocation*.

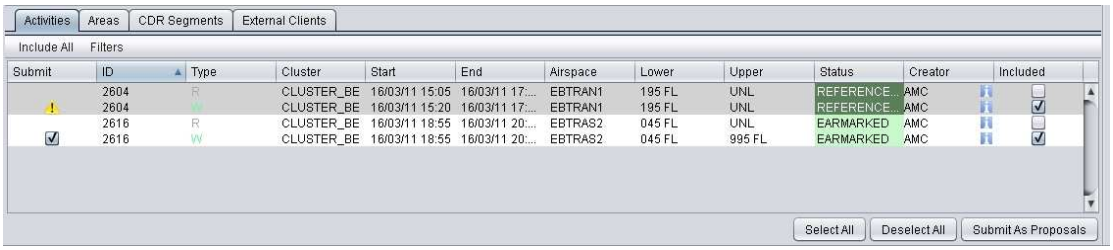
At the far right end of the Activities Tab there is a column *"Included".* For each reservation and what-if there is a checkbox allowing the user to select if he wants to assess the allocation with the original reservation (check box selected on the original reservation) or with its what-if (check box selected for the what-if reservation).

It is possible to create a large number of what-ifs and then select any combination of what-if and original reservations for an assessment until the best solution is found.

5.3.2 Submitting Proposals

Once a suitable solution is found, the selected what-ifs can be submitted automatically as proposals to the appropriate users. The mechanism is transparent to the users – they are not aware if a proposal was created manually via the *Airspace Reservation Editor* on the *Planning Display* or via the *What-if Functionality*. Once the proposals are sent off they will appear as actions on the LARA Clients of the applicable users and are handled as described earlier in this manual.

To submit a what-if as proposal a user has to use the outermost left column on the *Activities Tab of the PPT* named *"Submit"* and select the applicable what-ifs. It is possible to select or de-select all via the *"Select All and Deselect All Buttons* at the bottom of the Tab.



Submitting proposals from the PPT

Once the selection is complete, pressing the *Submit As Proposals Button* will send off the proposals. The reservation bars will turn blue on the PPT and the what-if turns to a proposal on the *Actvities Tab* – indicated by a *Blue "P".*

If the checkmark is not available and replaced by an exclamation mark, then the user does not have sufficient privileges to make a proposal at this time. Please refer to the section on proposals in this manual for more details.

For additional information hover over the exclamation mark to trigger a pop-up with more details.

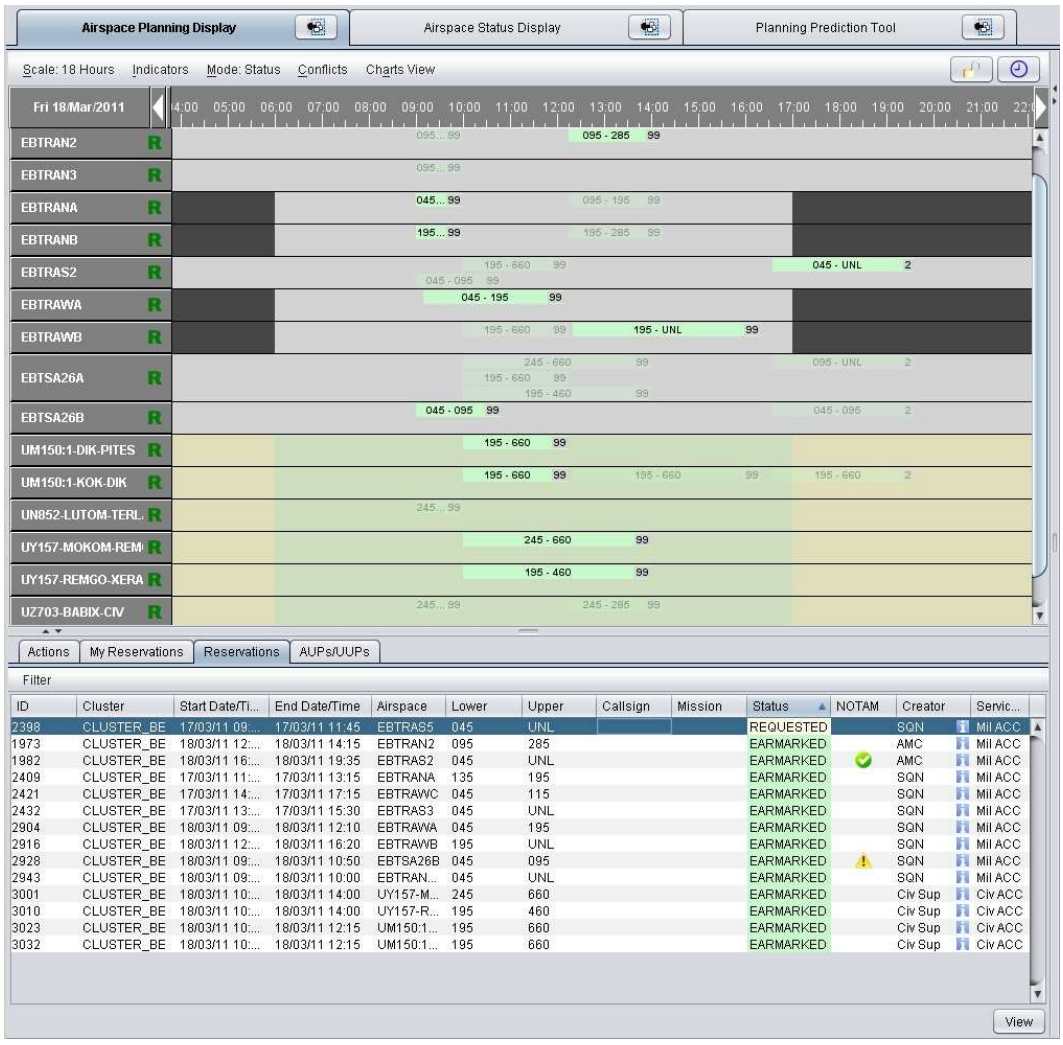
In the example used here, a proposal is not possible as the reservation is already in status Reference Allocated.

6 Publishing Airspace Use Information

6.1 Interface to CIAM

LARA offers the possibility to publish its planning information to other systems or users. The functionality is designed to adhere to current airspace management processes in Europe and interfaces seamlessly with *CIAM – the CFMU Interface for Airspace Managers*.

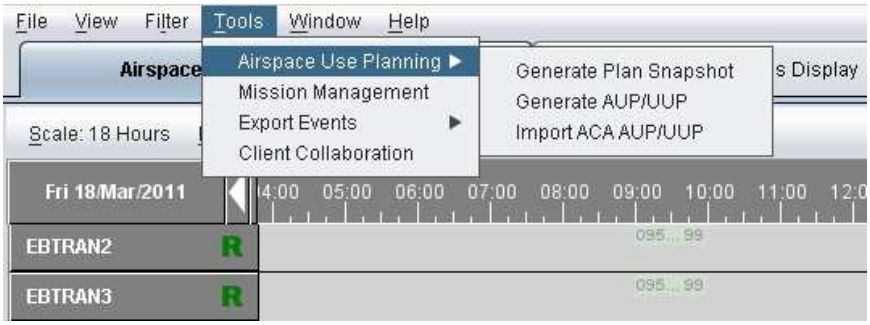
The screenshot below from the AMC client displays the situation after finalization of the plan and prior exporting this plan to CIAM for further processing: the reservations have all reached the highest level of approval and are ready for export to produce the Airspace Use Plan (AUP) for the next day.



The Airspace Planning Display prior preparing the data export

6.2 Generating Airspace Use Plan Information

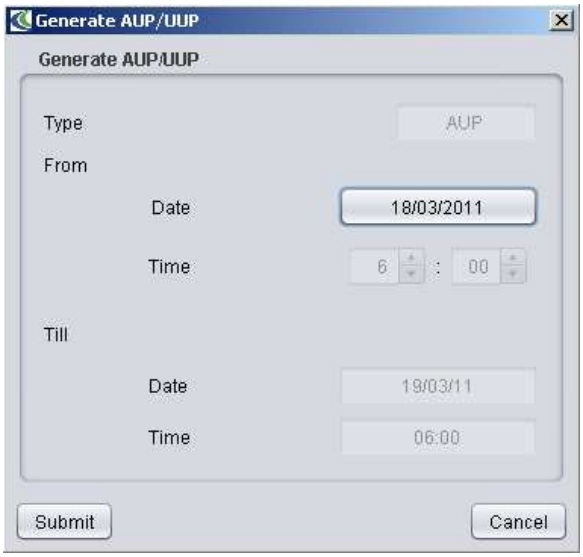
The first step to exporting planning details is to generate the AUP Draft in LARA. This is achieved by navigating to the *Tools Menu* and selecting *Air Space Use Planning → Generate AUP/UUP*.



The access to the AUP Functionality is found in the Tools Menu

Note: AUP stands for Airspace Use Plan and UUP for Updated Airspace Use Plan. The Airspace Management Process and its publications (AUP/UUP etc) will not be discussed in this manual. The guidelines for airspace management in Europe can be found in the EUROCONTROL Handbook for Airspace Management. Please refer to this document for more information if required.

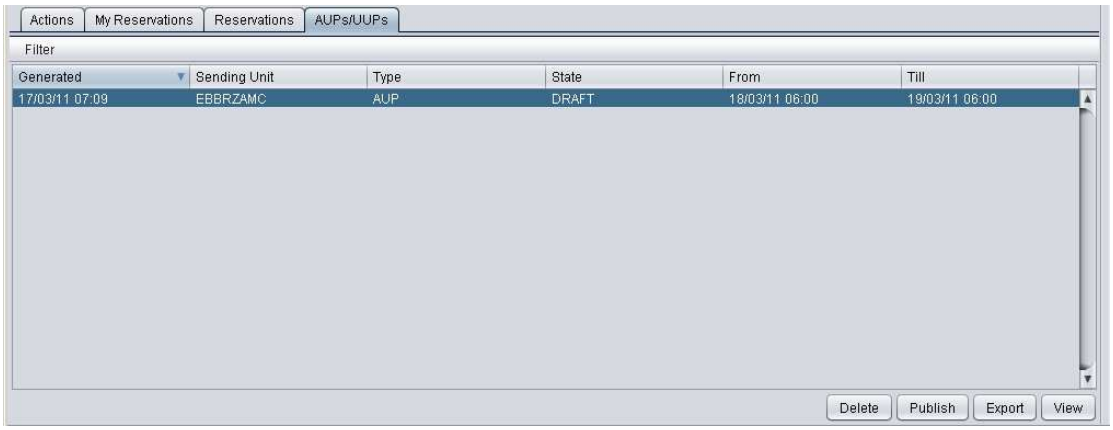
The AUP/UUP functionality is only available if a user has been granted access by the LARA System Administrator. If it is available, it will open the following window, which allows selecting the date for which the AUP/UUP data shall be produced. The default follows the ASM process and pre-selects the next day and a time frame from 06:00 until 06:00 the following day. (24h time frame).



The Generate AUP/UUP Window allowing to specify the date

If the current date is chosen LARA assumes it is an UUP and will call it an UUP instead of AUP. Once the *Submit* button is pressed the generated AUP/UUP will be available in the *Planning Information Display* on the *AUPs/UUPs Tab*. These are now visible and accessible on all connected working positions in the local cluster.

Note: The functionality is named AUP/UUP Generation. Strictly speaking, LARA only assembles the data required for producing these publications. The expansion of the CDR and ATS routes Network is done with CIAM to produce the actual AUP/UUP.



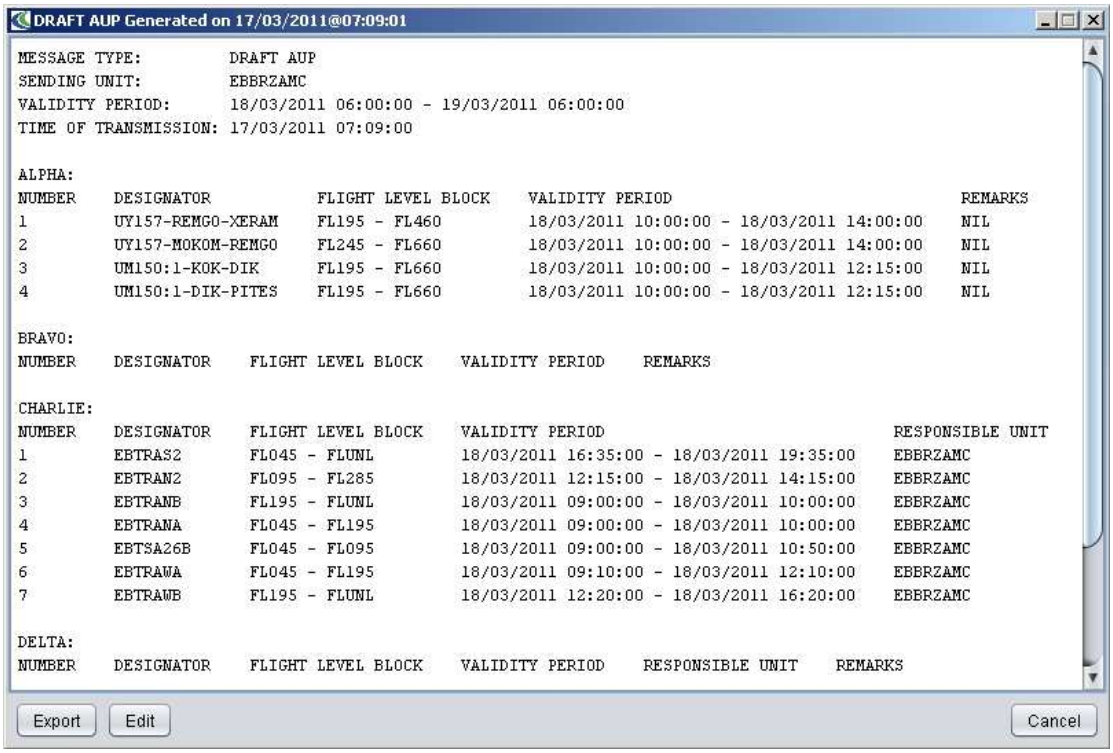
AUPs/UUPs are accessible from the respective tab of the Airspace Planning Display

The tab is providing details on when and by whom the AUP/UUP was generated and for which time period it was produced. The current state is DRAFT. Additional steps are required to publish the AUP and promote it to the FINAL state. This will be explained in the following section.

6.3 Publishing AUP Information

The AUP/UUP Tab shows four buttons at the bottom of the display allowing to further process the AUP. These are:

- *Delete* – this will delete the selected entry.
- *Publish* – this can be used if no interface to *CIAM* is available. Selecting this button will turn the *DRAFT* into a *FINAL* Version and advance all reservations published in the AUP/AUUP to the status *ALLOCATED. However, the availability of CDRs will not be up-to-date.*
- *Export* – the Export functionality will allow exporting the AUP/UUP in different formats to make them available to other systems.
- *View* – This button will open the following window displaying the contents of the AUP/UUP in a standardized format. For details on the format please refer to the Airspace Management Handbook.

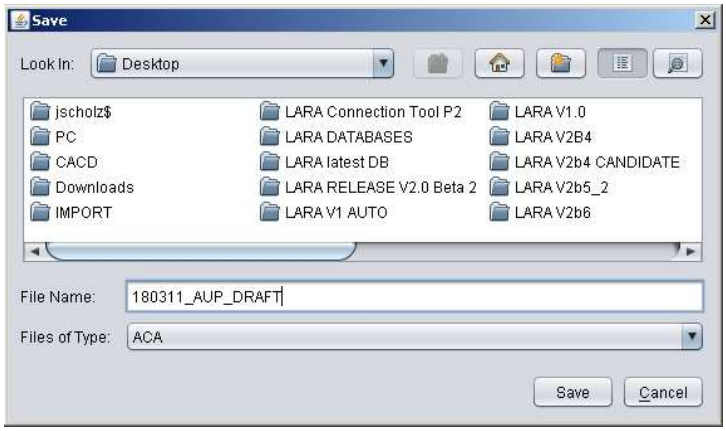

DRAFT AUP Generated on 17/03/2011@07:09:01
MESSAGE TYPE: DRAFT AUP
SENDING UNIT: EBBRZAMC
VALIDITY PERIOD: 18/03/2011 06:00:00 - 19/03/2011 06:00:00
TIME OF TRANSMISSION: 17/03/2011 07:09:00
ALPHA:
NUMBER DESIGNATOR FLIGHT LEVEL BLOCK VALIDITY PERIOD REMARKS
1 UY157-REMGO-XERAM FL195 - FL460 18/03/2011 10:00:00 - 18/03/2011 14:00:00 NIL
2 UY157-MOKOM-REMGO FL245 - FL660 18/03/2011 10:00:00 - 18/03/2011 14:00:00 NIL
3 UM150:1-KOK-DIK FL195 - FL660 18/03/2011 10:00:00 - 18/03/2011 12:15:00 NIL
4 UM150:1-DIK-PITES FL195 - FL660 18/03/2011 10:00:00 - 18/03/2011 12:15:00 NIL
BRAVO:
NUMBER DESIGNATOR FLIGHT LEVEL BLOCK VALIDITY PERIOD REMARKS
CHARLIE:
NUMBER DESIGNATOR FLIGHT LEVEL BLOCK VALIDITY PERIOD RESPONSIBLE UNIT
1 EBTRAS2 FL045 - FLUNL 18/03/2011 16:35:00 - 18/03/2011 19:35:00 EBBRZAMC
2 EBTRAN2 FL095 - FL285 18/03/2011 12:15:00 - 18/03/2011 14:15:00 EBBRZAMC
3 EBTRANB FL195 - FLUNL 18/03/2011 09:00:00 - 18/03/2011 10:00:00 EBBRZAMC
4 EBTRANA FL045 - FL195 18/03/2011 09:00:00 - 18/03/2011 10:00:00 EBBRZAMC
5 EBTSA26B FL045 - FL095 18/03/2011 09:00:00 - 18/03/2011 10:50:00 EBBRZAMC
6 EBTRAWA FL045 - FL195 18/03/2011 09:10:00 - 18/03/2011 12:10:00 EBBRZAMC
7 EBTRAWB FL195 - FLUNL 18/03/2011 12:20:00 - 18/03/2011 16:20:00 EBBRZAMC
DELTA:
NUMBER DESIGNATOR FLIGHT LEVEL BLOCK VALIDITY PERIOD RESPONSIBLE UNIT REMARKS
Export
Edit
Cancel

The AUP/UUP View in LARA

From this view the AUP/UUP can be exported and edited. Pressing the *Export Button* will open a dialogue allowing the user to choose the directory, name and format for the exported file.

The following formats are available:

- *ACA* is the format used by CIAM and will be used to export and import files with this CFMU System.
- *ADEXP* stands for *Air Traffic Services Data Exchange Presentation* and is a commonly used format in Air Traffic Control and Command and Control Systems.
- *Plain Text* will export the file in a human-readable text format for any other use.



Exporting an AUP/UUP via the appropriate dialogue

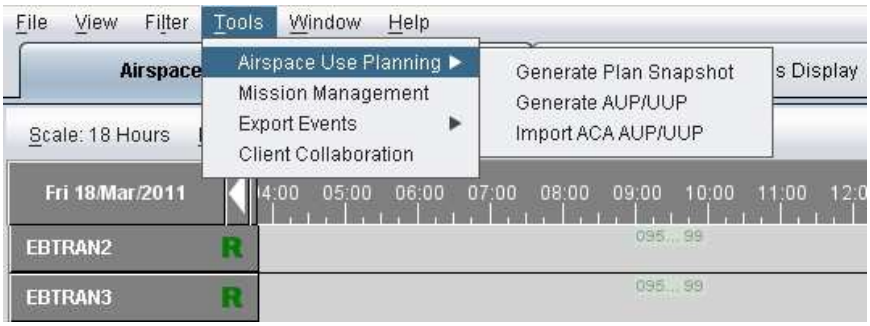
In order to export the data to CIAM the ACA Format will be selected and the file is saved to disk. CIAM will use the data in this file, expand the available CDR and ATS routes Network and produce the final AUP (ACA Format), which will then be re-imported into LARA. There are two reasons to re-import the final AUP/UUP into LARA:

- To obtain the correct availability of CDRs and ATS routes (CDR1 and ATS routes Closures and CDR2 Openings) in LARA
- To verify that the published plan (AUP/UUP) is in line with the data managed in LARA.

Note: LARA is used for managing airspace activations and airspace status. If the published information is not in line with the LARA data this can lead to Safety Implications.

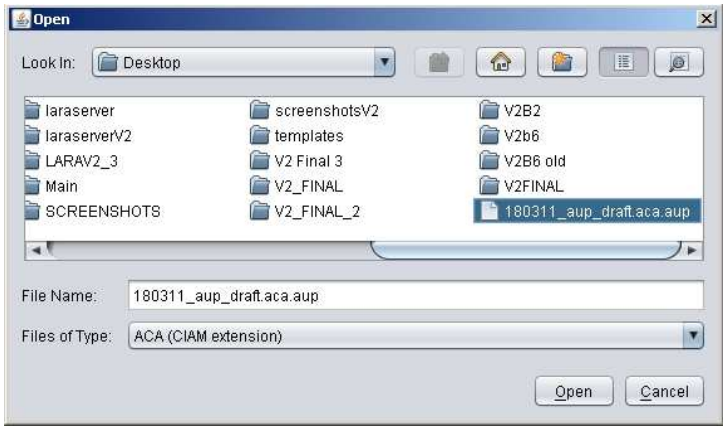
6.4 Re-import of AUP/UUP

To import the CIAM file, select *Tools → Airspace Use Planning → Import ACA AUP/UUP*.



The Airspace Use Planning Menu is used to import the final AUP/UUP

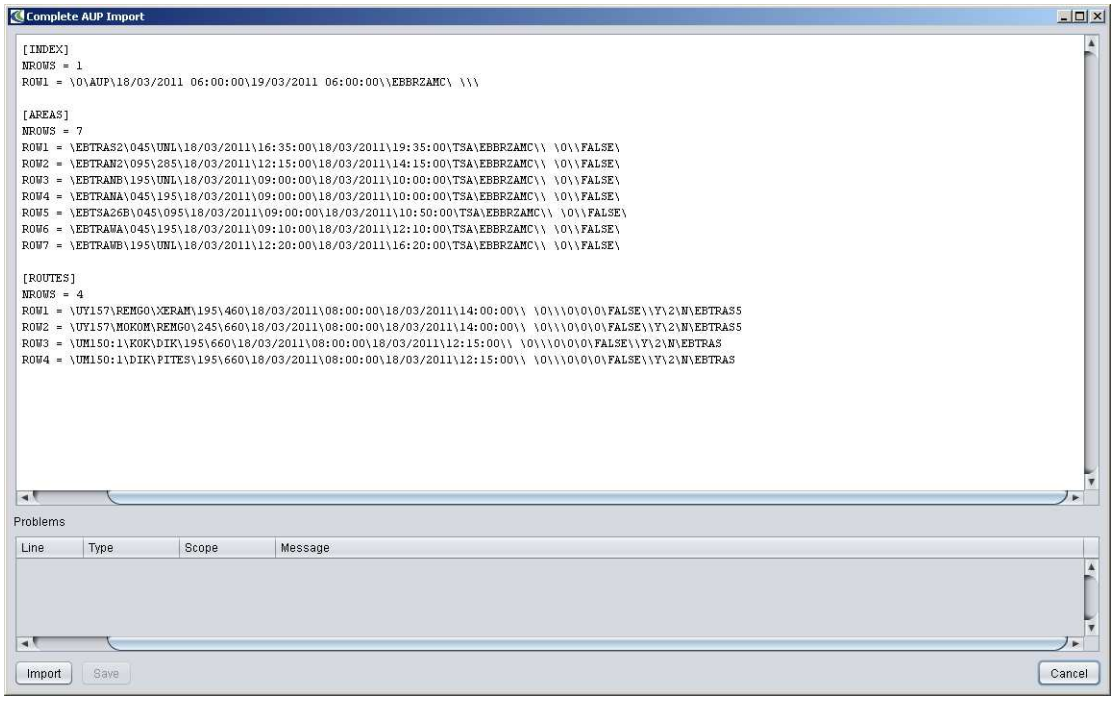
A standard dialogue will open to browse and select the appropriate file.



Importing the ACA File from CIAM

After selecting and opening the file, LARA will display the *AUP Import Window* displaying the contents of the file for review. The data are editable, i.e. it is possible to click into the text field and change the contents if required.

Ta save any changes use the *Save Button*, to import the file into LARA, select the *Import Button*.



The AUP Import Window displaying the contents of the AUP/UUP from CIAM

Inconsistencies between the imported information and the information contained within LARA will trigger certain warning messages.

If a mistake is obvious to the system it will be displayed in the *Problems Section* placed at the lower end of the *AUP Import Window*, e.g. if the number of rows stated in the file does not match the actual number of rows.

Another type of warning is a message window that appears after pressing the *Import Button* stating the reason for the warning. These reasons can be:

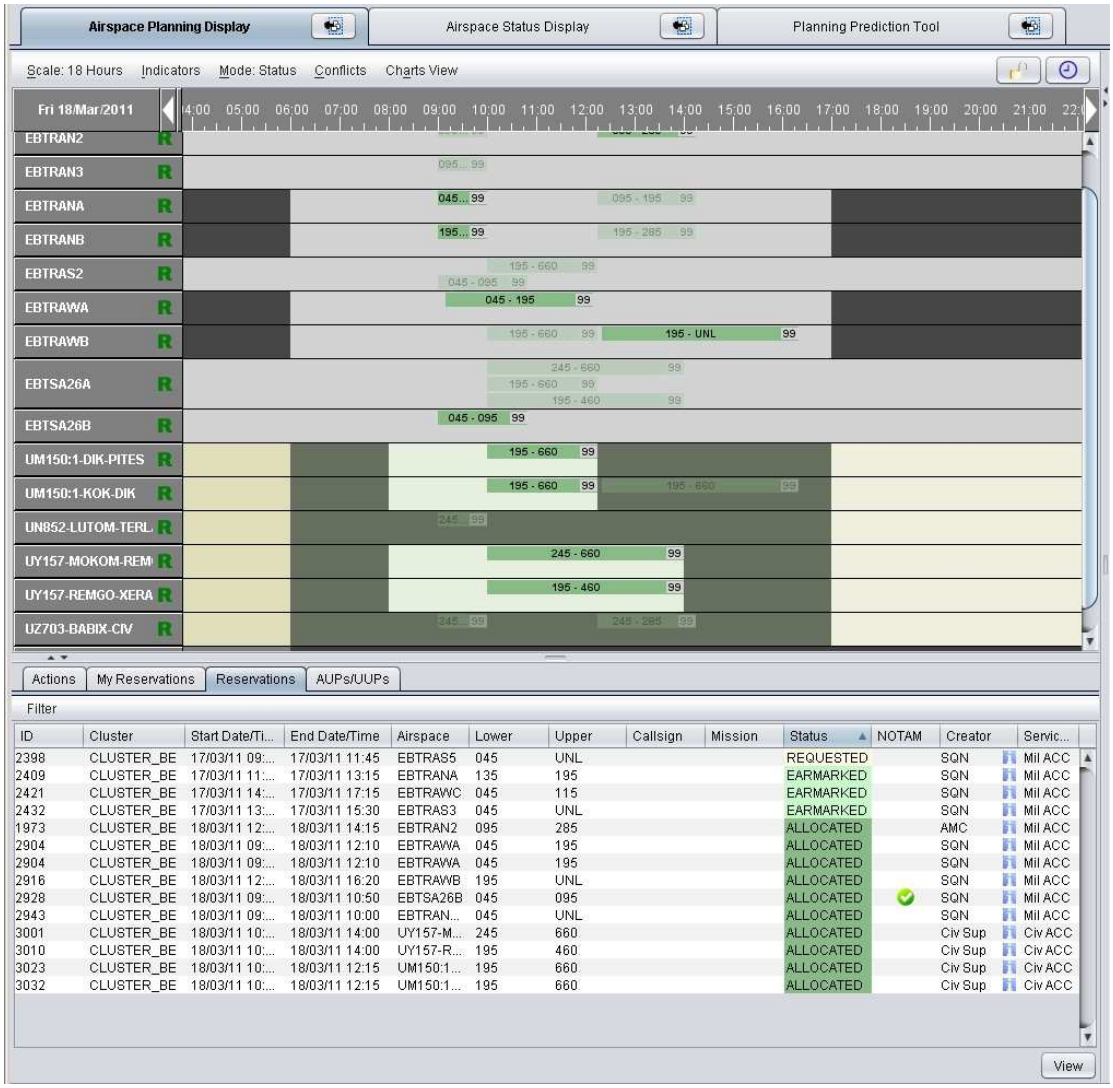
- The airspace does not exist or is spelled differently
- The details of a reservation does not match the data in LARA

Note: The alignment of the data in CIAM and LARA is very important to allow seamless operability between the two systems and enable exchange of the AUP ACA Files.

Once the import is successfully done, the GANTT Chart of the APD will change for the applicable time frame:

- The reservations which were published in the AUP will advance to status *ALLOCATED*.
- The background colour of CDRs will change; indicating their *availability* as published. For details on the colour schemes select the *Help Menu → Legends*
- In the *AUP/UUP Tab* an additional entry will show representing the AUP/UUP in *FINAL* Status.

Note: In the current LARA V2, the AUPs/UUPs are only available on the local cluster, Foreign clusters will not have access to the AUPs/UUPs. This is applicable as well to the availability display of CDRs. The background colours will only change on the local cluster. Full availability of the AUP/UUP across all clusters is foreseen for future versions of LARA.



The Airspace Planning Display after the published AUP is imported

6.5 Generating Plan Snapshots

The AUP/UUP functionality is tied to current processes in Airspace Management and is therefore limited by the applicable rules.

In order to offer additional flexibility and to allow data from LARA to exported for other uses, the system allows generating *Plan Snapshots*, which follow the AUP functionality, but offer additional options. This functionality is available for all users and is not limited to certain roles.

To access this functionality, select from the *Tools Menu → Airspace Use Planning → Generate Plan Snapshot.*

Generating Plan Snapshots offering additional options

The *Generate Plan Snapshot* Window allows the following options beyond the AUP/UUP Options:

- The AUP functionality is limited to a time frame of 24 hours – only the date was freely selectable. For the snapshot, the user can select any time frame by specifying the start and end time and date.
- The AUP only contains *AMC Manageable Airspaces*. The snapshot allows selecting *Non-AMC Manageable Airspace* to be included as well. It is as well possible to only select the *Non-AMC-Manageable Airspace* for inclusion.
- The AUP only contains reservation requests, which have received final approval. The *Snapshot Functionality* allows selecting a *Minimum Reservation State* from the drop down menu. All reservations which are at least on this status will be included in the snapshot.

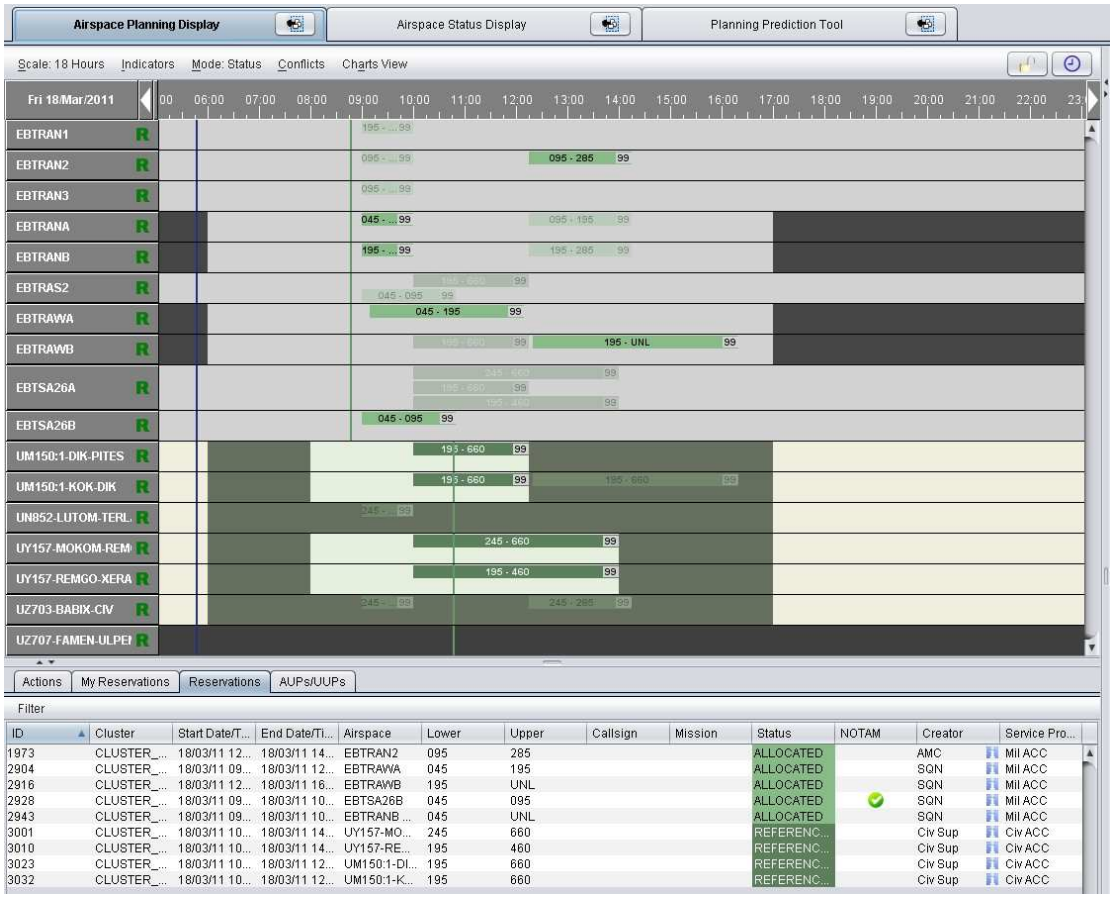
Once the *Submit Button* is pressed, the snapshot will be available in the *AUP/UUP Tab* and can be viewed and exported for further use. Only the *Publish* functionality is not available for *Plan Snapshots*.

While AUPs/UUPs are available on all clients within the cluster, the snapshots are only available and visible on the client for local use.

7 Airspace Status and Activation

7.1 Airspace Status in LARA

Airspace Management in LARA does not end with the Planning Phase, but extends into the Tactical Phase allowing users to monitor and manage airspace activations depending on their responsibilities. The picture below illustrates the planning that was mainly finalized yesterday, is now entering the day of operation and the tactical phase.



The Airspace Planning Display on the day of operations

LARA offers two ways of managing airspace activations:

- Automatic Activation Mode – areas will be activated according to reservations contained in LARA without further intervention, i.e. as soon as a reservation hits the current time it will turn the respective area(s) active; after it has passed it will be deactivated. A configurable time (default is 20 minutes) prior activation, an area will change to the Pending Status to warn all about the

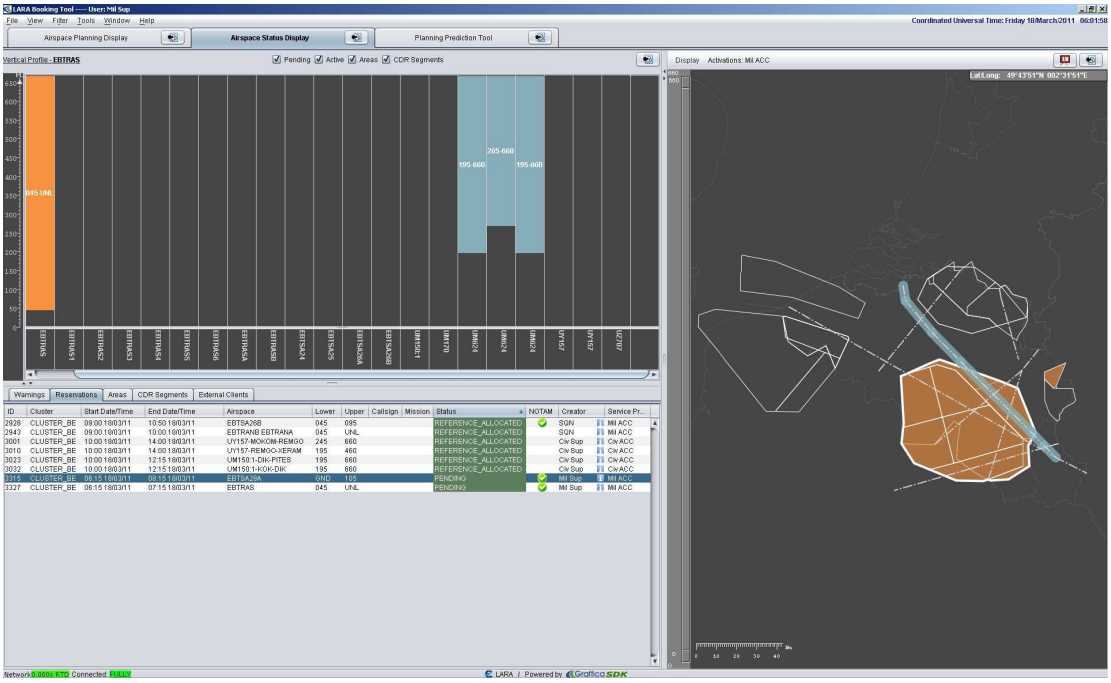
upcoming activation. Only fully approved reservations will trigger activations. The CDR segments will be available/closed according to the published AUP/UUP respectively.

- Manual Activation Mode – using this mode in LARA will require the responsible supervisors to actively confirm and acknowledge any activation of an area.

This chapter will initially explain the Automated Mode. At a later stage the more complex Manual Mode will be described.

7.2 Airspace Status Display HMI

The Activation process in LARA is managed and monitored on the last remaining of the main tabs: the Airspace Status Display Tab. Some HMI elements of this tab have already been explained in the chapters on the APD and PPT. This chapter will focus on the distinct Status Display features.



The Airspace Status Display displaying two airspaces in status Pending

The ASD consists mainly of three different sections:

- The Vertical Activation Display showing the vertical activation profiles of an airspace and all of its overlapping airspace elements. This works as described in the PPT Section.

- A lateral Airspace Status Display showing the activation status of airspaces in a top-down view. This works as well as described in

the PPT Section. The resemblance to the PPT is obvious as the PPT is used to simulate the activation phase.

- An additional Information Display allowing to access information via various tabs.

In the above screenshot two airspaces are displayed in orange to indicate the PENDING Phase. The following colours for the status:

- Orange is used to indicate the Pending Status of an area. The area is not yet active, but according to the plan it will become active a pre-defined time in the future (default is set to 20 minutes), i.e. the area will turn orange 20 minutes prior the planned activation.
- Red is indicating that an area is currently active and not available.
- Green is indicating that an area is active and available for use.
- Blue is used for CDRs and indicates (at least partial) availability. If at least one flight level is available the CDR will be displayed as available in blue. If the CDR is completely not available it is displayed without colour.

Note: The use of green or red is dependent on the Agency a user belongs to. If the user's agency is selected as the Service Provider for a reservation, the areas will be displayed in green indicating availability.

For other agencies or for users not connected to any agencies it will be displayed red.

Users not assigned to any agency can select which agencies view they prefer to see via selecting the appropriate agency from the Activations Menu on the Airspace Display.

If no agency view is selected, all active areas are displayed in red.

The Airspace Status Information Display and its tabs will show slight differences depending on whether the automatic or manual mode of activation is selected. This is due to the fact that the required confirmation and acknowledgement process in the manual mode of operation is managed from these tabs. This will be explained in more detail later in this chapter.

The picture below shows the tabs on the ASD in automatic mode. The following tabs are available:

- Warnings - If there are any warnings, outstanding actions to be performed, they will be listed here. The Warnings Tab has a Suppress Button. Selecting a message and pressing this button

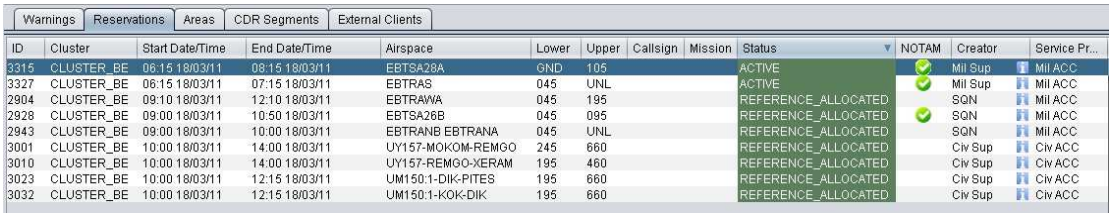
will remove the message from the display, indicating that it is understood.

- Reservations – The Reservations Tab lists all reservations that are REFERENCE ALLOCATED, PENDING and ACTIVE. It provides an overview over the upcoming activities. The columns are identical to the Reservations Tab of the Airspace Planning Display.

- The Area and CDR Segment Tab provide additional information on the airspaces and their activation status.

- External Clients – is indicating the connection status and any warning resulting from connections to external clients using the LARA Status Information.

Note: LARA has an interface that can be used to provide airspace planning and status information to external systems like an ATC System or CIMACT. This allows the airspace status to be displayed on the controller working positions itself. If the communication between LARA and the External Client is not properly working, a warning will be issued to the LARA User.



ID	Cluster	Start Date/Time	End Date/Time	Airspace	Lower	Upper	Callsign	Mission	Status	NOTAM	Creator	Service Pr...
3315	CLUSTER_BE	06:15 18/03/11	08:15 18/03/11	EBTSA28A	GND	105			ACTIVE		Mil Sup	Mil ACC
3327	CLUSTER_BE	06:15 18/03/11	07:15 18/03/11	EBTRAS	045	UNL			ACTIVE		Mil Sup	Mil ACC
2904	CLUSTER_BE	09:10 18/03/11	12:10 18/03/11	EBTRAWA	045	195			REFERENCE_ALLOCATED		SQN	Mil ACC
2928	CLUSTER_BE	09:00 18/03/11	10:50 18/03/11	EBTSA26B	045	095			REFERENCE_ALLOCATED		SQN	Mil ACC
2943	CLUSTER_BE	09:00 18/03/11	10:00 18/03/11	EBTRANB EBTRANA	045	UNL			REFERENCE_ALLOCATED		SQN	Mil ACC
3001	CLUSTER_BE	10:00 18/03/11	14:00 18/03/11	UY157-MOKOM-REMGO	245	660			REFERENCE_ALLOCATED		Civ Sup	Civ ACC
3010	CLUSTER_BE	10:00 18/03/11	14:00 18/03/11	UY157-REMGO-XERAM	195	460			REFERENCE_ALLOCATED		Civ Sup	Civ ACC
3023	CLUSTER_BE	10:00 18/03/11	12:15 18/03/11	UM150:1-DIK-PITES	195	660			REFERENCE_ALLOCATED		Civ Sup	Civ ACC
3032	CLUSTER_BE	10:00 18/03/11	12:15 18/03/11	UM150:1-KOK-DIK	195	660			REFERENCE_ALLOCATED		Civ Sup	Civ ACC

The Airspace Status Information Display

As the ASD displays airspace status information, the filtering functions are restricted to avoid users filtering our essential information. This has the following effect:

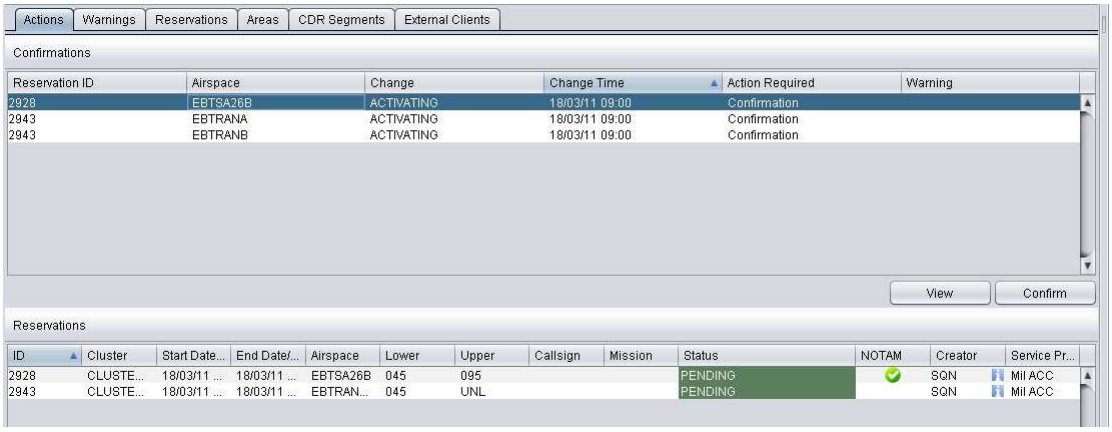
- The ASD Map will always display all areas and CDR Segments available in the database. The possibility to filter airspaces via the Preferences Menu does not have any effect on the ASD

- It is not possible to filter out CDR Segments and Areas via the Display Menu of the ASD Map. Only Fixes can be selected not to be displayed.

- Two filters are accessible via the Filters Menu. They allow filtering all non-active airspaces (neither Active nor Pending) and all airspaces from foreign clusters.

7.3 Manual Activation Process in LARA

If LARA is configured to use the manual activation process, the supervisors will find one additional tab on the *Airspace Status Information Display*: the *Actions Tab*.



The Action Tab requiring the supervisor to confirm the activation

The logic of the process is as follows: once a reservation enters the Pending State and the corresponding areas turn orange on the ASD, the supervisor responsible for the area (i.e. the supervisor of the Agency defined in the ARE for the reservation) will receive an action to *Confirm* the activation.

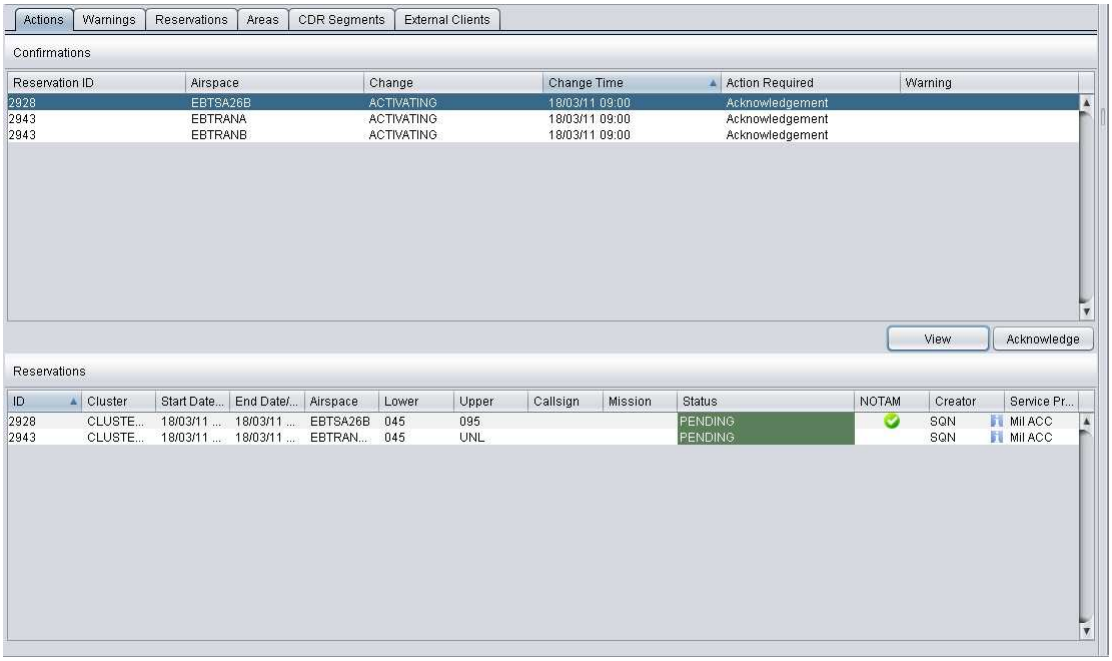
This Action will be displayed in the Actions Tab of the Status Information Display as shown above. Additionally, the supervisor will be warned about this action by a red flag flashing in the lower right corner of the LARA Display. The number next to the flag indicates the number of outstanding airspace activation actions.

The Red Flag indicates to the supervisor outstanding confirmations and acknowledgements

Once the supervisor has selected the respective row in the actions tab and pressed the *Confirm Button*, the activation is confirmed.

Now, the counter-supervisor(s) (all other supervisors which agency is marked as responsible for an airspace – to be configured by LARA Housekeeper) will receive an action to *Acknowledge* the activation.

Only after the *confirmation and acknowledgment* of all required supervisors is performed, the airspace will be activated at the time specified in the reservation. The same process applies for de-activating an airspace.



After the confirmation is complete, the other supervisors have to acknowledge

Note: Regarding the status, LARA distinguishes between reservations and airspaces: Reservations will always turn active at their scheduled start time – regardless of the mode. This reservation will be composed of one or more airspaces – these airspaces will only turn active if their activation is confirmed and acknowledged.

Therefore the supervisors will confirm and acknowledge the activation of the airspace and not the reservation. For this reason the Action Tab is composed of two sections. The upper section deals with single airspaces and the confirmation/acknowledgements; the lower section displays the connected reservations.

Double-clicking an airspace entry in the actions tab will open the *Reservation Editor* for the related reservation for accessing the details. If sufficient privileges are available, the contents of the reservation can be modified.

Subject to confirmation and acknowledgement are only *areas and CDR3s*. CDR2 are marked as available as published and specified in the imported AUP/UUP. CDR1 are open by default, unless they have been closed by the imported AUP/UUP.

The following scenarios are possible in the manual activation process:

- The *Confirmation and Acknowledgements* are performed within the *Pending Time*. The airspace(s) will turn active as specified in the reservation. If one of the actions is not performed ten minutes prior scheduled activation time, a warning message will be sent and displayed in the *Warnings Tab* of the ASD.

- One of the actions is not performed prior scheduled activation time: The airspace will remain in status *PENDING* until all actions are completed. In case the actions are not completed by the

scheduled end time of the reservation, the *PENDING* Status will diminish and the reservation will receive the status *EXPIRED*.

- The same logic applies for de-activating airspace: the airspace will remain *ACTIVE* until all actions are completed.

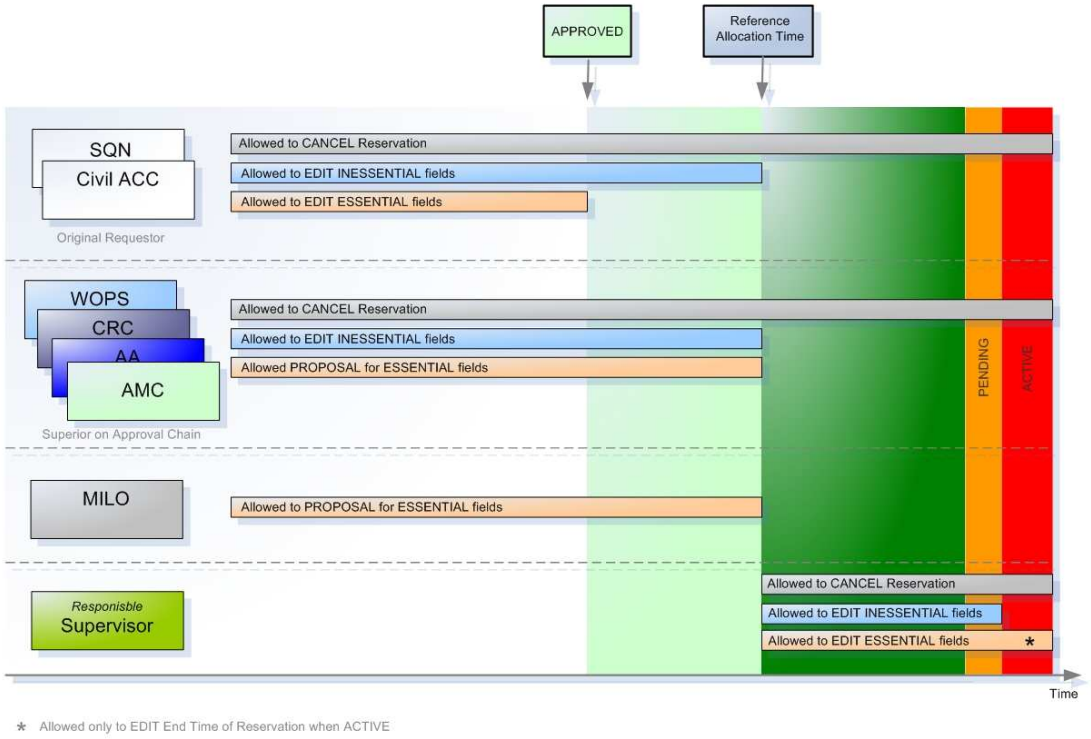
7.4 Supervisor Privileges

The responsible supervisor for an airspace activation (depending the Agency selected in the Airspace Reservation Editor) has certain possibilities to edit a reservation during the phases of *REFERENCE ALLOCATED, PENDING and ACTIVE*.

Below figure illustrates the privileges certain users have in editing parts of a reservation. With a reservation turning *REFERENCE ALLOCATED* all privileges to edit or cancel a reservation are resting solely with the responsible supervisor.

Before the reservation changes to *ACTIVE* all (*essential and inessential*) fields are editable by the supervisor. They will change immediately and will not form a proposal directed at the originator.

Once the reservation goes *ACTIVE* it can either be cancelled or the end time changed – all other changes are locked at this point.



The privileges of the different users/roles

8 Additional Information

8.1 LARA Issue Reporting Database - EVENTUM

This section shall enable LARA Users to use the EVENTUM Issue Tracking Database for reporting Fault Reports and Change Requests.

The EVENTUM Database is hosted and maintained by the EUROCONTROL CIMACT Team based at the Maastricht Upper Area Control Center and is available via the WorldWideWeb.

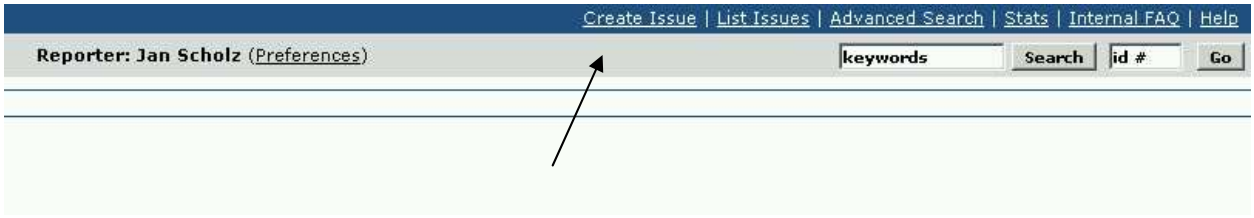
It is available at the following address:

https://www.cimact.eu

You will be presented with a Log-in window asking for your email address and password.

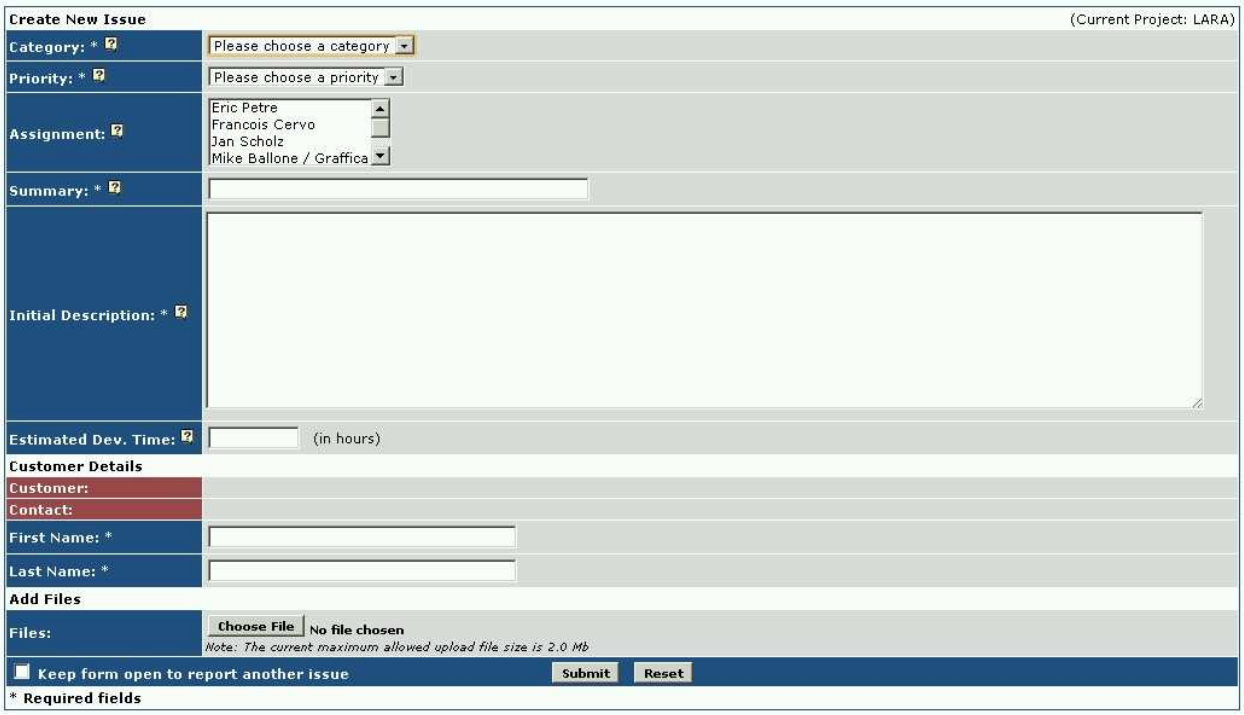
A user can request an account by choosing the “Signup for an Account” Option. After successful creation and confirmation you will have access to EVENTUM. Please note: at this stage you still require appropriate privileges to create and view issues. These will be assigned to you after we verified the user and the appropriate level of access rights.

Once your account is setup you can start introducing issues into the system.


Create Issue | List Issues | Advanced Search | Stats | Internal FAQ | Help
Reporter: Jan Scholz (Preferences)
keywords
Search
id #
Go

Selecting “List Issues” will provide an overview over all the issues that have been inserted by the logged-in user.

To enter a new issue, click on “Create Issue”, which will open the following window:



- Please select in “CATEGORY” if you consider your issue to be a Fault Report, Change Request or Request for information.
- Specify a PRIORITY and leave the ASSIGMENT Window as is.

  Please note that during the analysis of the LARA Team the values CATEGORY and PRIORITY might be adapted if required.
- In the field SUMMARY specify in a few words what your issue is about. This shall enable us quickly identify an issue in a list view. Please specify at the beginning of the summary your Cluster in brackets, e.g.: [NL] Cluster_NL cannot connect to CLUSTER BE
- In the INITIAL DESCRIPTION Field explain in detail the Issue observed including the steps that lead to a certain behavior and

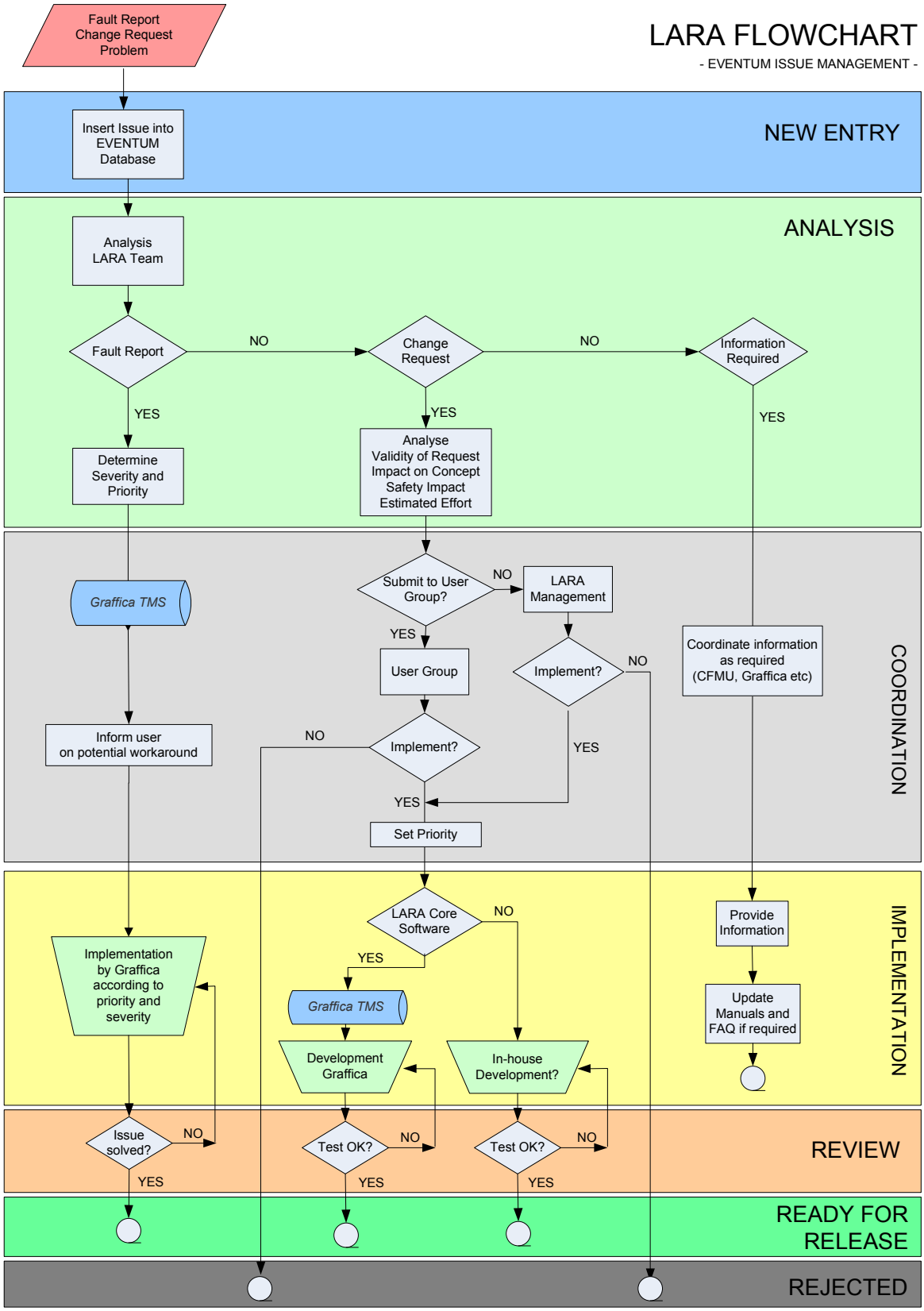
specific circumstances that trigger a fault. In case of Change Requests, specify your reasoning for requesting this software change.

- Enter you name in the FIRST NAME / LAST NAME Fields.
- If available, you can attach screenshots, log-files, and database back-ups via the FILES Section.
- When you are done, press SUBMIT.

Your Issue will be inserted into the LARA Issue Database in the status “NEW ENTRY”. It will be handled according to the Flow Chart below within the LARA Team. You will receive an email as soon as your issue has been changed/updated in the process.

LARA FLOWCHART

- EVENTUM ISSUE MANAGEMENT -



8.2 Frequently asked questions

- will follow -

8.3 Safety Requirements

The following Application Safety Requirements were established during the FHA, PSSA and SSA processes. Those arising from the FHA are documented in Appendix A: FHA Tables. In some cases the wording of the requirements has been made more precise, for example to ensure that each is written using “shall”.

Additional safety requirements leading to procedures to be fulfilled by the end users have been identified during the development phase and were checked during test and validation.

The safety requirements have been divided into the safety requirements which can be and are fulfilled by the LARA product (Table 6-2) and the ones that need to be fulfilled by the end-user (Table 6-3).

The LARA ANSP Safety Case should confirm that the safety requirements assigned to the end-users have been implemented and validated in accordance with the ANSP safety management system.

ID	Functional Safety Requirement
LA-S007	Certain rules are defined in LARA to check the syntax of the information that is entered
LA-S010	A warning message shall be displayed in case that the other SUP does not confirm a notification message for activation or de-activation of an airspace.
LA-S011	A warning message shall be displayed in case that an external system does not confirm the correct receipt of a message.
LA-S013	LARA shall ensure that the data, which is in the database, is the same as the one provided at the hand-over point, and that the data which is provided at the hand-over point is the same as the data received by the ATC system.

Table 6-2 Functional Safety Requirements derived from the FHA

Note: the satisfaction of LA-S013 is demonstrated by analysis in the SSAR ([R44] LARA Software Safety Assessment Report) rather than by providing and testing LARA functions.

ID	Application Safety Requirement from FHA
LA-S001	The data that is sent out for the NOTAM request shall be displayed to the operator for validation.
LA-S002	In case that airspace users do not use LARA, special procedures shall be in place to ensure that the airspace activation is taking place consistently with the activity.
LA-S004	The import and customisation of data in LARA as well as the required verification and validation measures shall be defined in a procedure. After the import, a procedure shall verify that the data in LARA is consistent with the external source.
LA-S005	A procedure shall exist that requires the operator to validate a NOTAM request before it is sent out.
LA-S006	A procedure shall exist that requires the requester of a NOTAM to check whether the NOTAM that has been issued is consistent with what has been requested and the information that is stored in the LARA database.
LA-S008	A validation procedure shall be implemented that ensures - before operational use of the data - that the data exported and imported into another system is consistent with the data in the LARA database.
LA-S009	A procedure shall exist for the airspace manager to validate consistency of airspace demands.
LA-S012	A procedure shall exist that requires the supervisor to act in case that LARA displays the warning message that an external system has not received any information.
LA-SO14	A procedure shall be in place for airspace (de)-activation in case that not all users use LARA within one cluster.
LA-TST1	LARA does NOT require additional approval by the Supervisors when a reservation in active status has been changed (reservation duration reduced or prolonged). A procedure shall be in place in order that any changes to reservations within the reference allocation time shall be a subject to prior coordination between the responsible supervisors.
LA-TST2	LARA does NOT allow the same airspace to be defined on more than one LARA service (cluster). If this is the case,

	the clusters will be not able to communicate. Note that if adjacent clusters are connected, LARA housekeeper tool highlights the overlapping airspaces intended for import. A procedure shall be put in place to ensure that the clusters' airspace shall be clearly defined prior committing to the clusters' database. If possible, connection should be established with the adjacent cluster's servers prior to importing the static data
LA-TST3	When a reservation is introduced after the AUP/UUP publication, the potential conflicts of the reservation with the published CDR2 opening times will be not highlighted. A procedure shall be put in place to ensure that the responsible ASM manager crosschecks for potential conflicts prior earmarking reservations introduced after AUP/UUP publication
LA-TST4	Currently, it is not possible to link (associate) local airspace to foreign airspace. Booking an airspace in the local cluster which volume overlaps with an airspace defined in an adjacent cluster and under different name shall be done according to the agreed procedure
LA-TST5	AD-HOC management – Airspaces, e.g. Ad-hoc, not officially published, (via NOTAM, AIP) shall be tagged by the Housekeeper. The user manual shall refer to tagged airspaces.

Table 6-3 Safety Requirements to be fulfilled and verified by the End-User

8.4 Abbreviations

A	Altitude
AA	Approved Agency
AAR	Air-to-Air Refueling
ACA	AUP / UUP Message Composition Application
ACC	Area Control Centre
AD	Air Defense
ADEXP	Air Traffic Services Data Exchange Presentation
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation And Control
AMC	Airspace Management Cell
APD	Airspace Planning Display
ARE	Airspace Reservation Editor
ASD	Airspace Status Display
ASM	Airspace Management
ATC	Air Traffic Control
AUP	Airspace Use Plan
AVD	Airspace Visualization Display
c/s	Callsign
CDR	Conditional Route
CFMU	Central Flow Management Unit
CIAM	CFMU Interface for Airspace Managers
CMAC	Civil-Military ATM Coordination Division
CRC	Control and Reporting Centre
e.g.	For example
EUROCONTROL	European Organization for the Safety of Air Navigation
FAB	Functional Airspace Block

FL	Flight Level
GND	Ground
GSDK	Graffica Software Development Kit
HMI	Human Machine Interface
i.e.	This means
ICAO	International Civil Aviation Organization
ID	Identification (Number)
IP	Internet Protocol
ISO	International Organization for Standardization
LARA	Local and sub-Regional Airspace Management Support System
MILO	Military Liaison Officer
NOTAM	Notice to Airmen
PCA	Prior Coordination Area
PID	Planning Information Display
POC	Point of Contact
PPT	Planning Prediction Tool
R	Reservable / Non-Reservable if crossed out
RCA	Reduced Coordination Area
RTD	Return Trip Time (Network Performance)
RVA	Radar Vectoring Area
SQL	Structured Query Language
SQN	Squadron
TRA	Temporary Restricted Area
TSA	Temporary Segregated Area
UNL	Unlimited
UUP	Updated Airspace Use Plan
WOPS	Wing Operations Centre